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ORIGINAL ARTICLES.

REPORT OF CASE OF PAPILLOMA OF THE LARYNX—INTUBATION TUBE WORN FOUR YEARS.

Read in the Section of Laryngology and Otology at the Forty-third Annual Meeting of the American Medical Association, heald at Detroit, Mich., June, 1892.

BY F. E. WAXHAM, M.D.,

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Papillomata of the larynx, while classified among the non-malignant growths, are nevertheless of the gravest import when occurring in early life and especially in very young children.

The case coming under my observation is unique on account of the complications, the length of time the laryngeal tube has been worn, and the almost perfect comfort of the patient. The child has worn the tube since he was two and a half years old and is well developed, strong and healthy and does not complain of pain or irritation of the larynx as the result of its presence. Indeed much less discomfort is experienced than results from the presence of a tracheotomy tube.

June 17, 1888, I was called through the courtesy of Dr. J. S. Mitchel to see Arthur D., age two and one half years. His breathing was labored, the voice whispering, and the dyspnœa so great that the loud stridor was heard all over the room. Notwithstanding the difficulty of breathing he was busy and playful. The following history was obtained: His voice and cry were natural until an attack of measles which occurred at the age of one and a half years. During the attack of measles he coughed croupy and breathed with some difficulty but these symptoms disappeared. The voice had been husky for eight months and entirely suppressed for two months. The respiration had been more or less embarrassed for two months. The dyspnœa gradually increased. For three days the child had been breathing with great difficulty. The patient had been seen by a number of physicians, including the late Dr. H. A. Johnson, all of whom pronounced the case one of laryngeal obstruction due to papilloma.

As the color of the patient seemed good and as he was playing about it was thought safe to postpone operative measures for a few hours and to watch the case. Later in the day we were again called and found a decided change for the worse. The little fellow had become prostrated by the difficulty of breathing, the pulse had become rapid and feeble, and he was slowly dying from suffocation. It was decided to perform intubation with the hope that the introduction of the tube and subsequent pressure might destroy the growth. The operation was quickly and easily done, giving immediate relief and the patient passed into a quiet refreshing sleep. The next morning he was found riding his velocipede about the house and suffering no inconvenience from the tube. The tube was worn for six days without the least annoyance.

On the sixth day the tube was removed. The respiration was quite difficult for a few hours following its extraction. The dyspnœa, however, soon subsided and the respiration remained about as it was during the weeks preceding the urgent symptoms that led to the operation. The voice still remained suppressed and the respiration somewhat embarrassed for two weeks but not sufficiently so as to call for interference.

July 9. The urgent dyspnœa returned and it became necessary to re-introduce the tube which again gave immediate relief.

July 12. Removed the tube but the patient could not live without it. It was apparent that the simple pressure of the tube was not sufficient to destroy the growth. The upper and anterior portion of the tube was discolored showing the location of the greatest pressure. This portion of the tube was coated with collodion, this in turn with chromic acid and then another coating of collodion and the tube introduced, the idea being to destroy the growth by cauterization, as on account of the early age of the patient a laryngeal examination was impossible and the removal of the growth by the intralaryngeal method not practical. As laryngotomy at so early an age was extremely hazardous and in the great majority of cases very unsatisfactory, cauterization in this manner seemed worthy of a trial.

July 15. The tube was again removed and as the dyspnœa was great another application of chromic acid was made. On account of a previously arranged trip to Europe the case was placed in the hands of another physician. The tube was left in position for ten days when on account of some difficulty in removing it tracheotomy was performed. About this time the child contracted whooping cough which with a very severe diarrhœa, which possibly resulted from the constitutional effect of the chromic acid, greatly prostrated him. Under very skilful treatment, however, the patient soon rallied and was about the house again.

Oct. 1. Upon my return from Europe the patient was found in a very good condition but wearing a tracheotomy tube instead of the intubation tube.

Oct. 8. Gave the patient chloroform and made an examination of the larynx with the finger and laryngeal sound. The larynx was entirely closed on account of adhesions that had formed as the result of cauterization. The smallest laryngeal sound could not be passed and no air could be drawn through it when the tracheotomy canula was closed with the finger.

Oct. 14. With the assistance of Drs. Ingals and Jaggard of Chicago, Dr. Guibar, of Kansas, and Dr. King of Iowa, chloroform was given and laryngotomy performed. The adhesions were broken up and cut away as far as possible and portions of the papilloma still remaining removed and the surface thoroughly cauterized with nitrate of silver. The cartilages of the larynx were united with silver wire sutures, the wound dressed antiseptically and the tracheotomy tube left in position.

Oct. 21. Gave the patient chloroform and examined the larynx carefully. It was found nearly closed again. Only a very small laryngeal sound could be passed. This was introduced and the adhesions broken up as far as possible and the smallest size intubation tube introduced, which was left in position above the tracheotomy tube.

Oct. 28. The intubation tube removed and also the silver wire sutures.

Nov. 4. The wound entirely healed. The intubation tube was reintroduced, the patient wearing both the tracheotomy and intubation tubes with comfort, being able to eat and even to drink liquids in the upright position without difficulty.

Nov. 11. Removed the intubation tube and introduced a larger one.

Nov. 18. Removed the intubation tube and introduced a still larger one, shortened so as to be worn above the tracheotomy tube. Strangely enough the patient could not breathe through the intubation tube excepting with great difficulty and the tracheotomy tube was still worn.

Dec. 2. With the assistance of Dr. Ingals chloroform was again given and a careful examination of the larynx made. The papilloma seemed to be reappearing about the base of

the epiglottis which upon inspiratio n was drawn down over the opening of the tube, thus preventing respiration through it.

Dec. 8. With the assistance of Dr. Hawk, of Iowa, chloroform was administered and the growth at the upper portion of the larynx removed with a curette. A tracheotomy tube with an opening in the outer canula was also introduced.

Dec. 11. He was able to breathe quite comfortably through the intubation tube with a cork in the tracheotomy tube.

It is unnecessary to detail the further history of the case. There has been a constant tendency to recurrence of granulation tissue above the head of the intubation tube requiring frequent operations. The intubation tube was changed on an average of once a month, its diameter being gradually increased. The tracheotomy tube was removed and cleansed daily by the attendants. After wearing both intubation and tracheotomy tubes for two years the latter was dispensed with and the intubation tube increased both in length and diameter. For the last two years the intubation tube alone has been worn. The patient at times wearing it as long as two months without changing. The head of the tube is occasionally altered in shape in order to prevent too long continued pressure upon one point. The patient is now able to do without his tube a few hours at a time. The boy is now six and a half years old and as strong and rugged as any boy of his age. We are hopeful that as he reaches puberty and as the larynx increases in size at this age there will be sufficient room for normal repiration notwithstanding the amount of cicatricial tissue present.

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Discussion.

Dr. Wigler called attention to the late paper of Dr. Hooper, of Boston, in which he described endo-laryngeal operations under chloroform in children. He also referred to an instrument lately devised by Dionisio, an endo-laryngeal speculum which holds the glottis open in the living subject.

Dr. Thrasher said that he was much interested in the paper of Dr. Waxham. About a year ago a 6 year old boy was brought to him suffering from dyspnœa. Examination revealed the chink of glottis blocked by a red granular mass, apparently papillomata. After a preliminary tracheotomy the larynx was pretty well cleared by the cutting forceps and when the respiration per *vias naturales* was restored (in about 3 weeks) the patient went home. In about 2 months he returned with an increased growth of the neoplasm. These were removed under cocaine at one sitting and the patient was not seen again for a month when the operation was again repeated. The recurring growths were removed at intervals of 4 to 8 weeks until January 1, of this year. At that time the dyspnœa was not sufficiently relieved by the attempted removal of the warty tissue and a small intubation tube was inserted to permit of the child's returning home. This tube was worn about a month and brought back in the hand of the patient, having been coughed out. Dr. T. then re-inserted a larger tube and the patient has worn a tube ever since. Some 3 weeks ago Dr. T. learned that the little fellow had taken whooping cough but was getting along as well as could be expected. There was a marked atrophy of the sessile growths, apparently from the pressure of the tube, after the tube had been worn for only a month, and this atrophy gradually continued up to the time of the invasion of the whooping cough, since when the patient has not been seen.

Dr. Von Klein remarked that he had been called in the night to see a case of dyspnœa from papillomatous obstruction. He attempted to introduce an intubation tube, failed, tried a smaller and found that there was not room to pass the smallest size tube. He then advised tracheotomy but parents objected and soon the child died of CO_2 poisoning.

HÆMORRHOIDS rapidly diminish in size, become free from secretion and pain, and generally improve, according to Dr. James, if powdered daily with pure calomel.

SPONTANEOUS CURE OF MULTIPLE PAPILLOMATA OF THE LARYNX AFTER TRACHEOTOMY.

SAME CASE ALSO DEVELOPED THE RARE ANOMALY OF PAPILLOMA OF THE EPIGLOTTIS.

Read in the Section of Laryngology and Otology at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY JOSEPH A. WHITE, A.M., M.D.,

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Frank Bigby, aged 5 years, was brought to me on June 11, 1886, suffering with dysphonia and severe attacks of dyspnœa. I had no difficulty in making a laryngoscopic examination, and found his trouble was due to the presence of several small growths of the larynx, located especially on the left cord and ventricular band near the commissure, and

Fig. 1.—In June, 1886.

also at the inter-arytenoid space. After two or three sittings to accustom the larynx to the contact of the forceps, I succeeded in removing the obstructions and cauterizing their seats with chromic acid. In October he was brought back because of the return of dyspnœa, and I found the growths had not only recurred, but also had extended to the right side. I also noticed a small protuberance on the lower face of the epiglottis on the right side as if a similar neoplasm were developing there. October 10, I operated with the forceps, removing most of the growths. November 14, he came back with a more decided recurrence, a regular cauliflower mass, and with the protuberance on the epiglottis developed into a small pediculated tumor. I again removed all the growths, and fearing they might be malignant, I sent one specimen to Dr. Wm. M. Gray, the pathologist of the Army Medical Museum in Washington, and another to Dr. Geo. Lefferts, of New York. The former replied that the growth was a hard papilloma, composed of squamous epithelial cells, and histeoid in character. Dr. Lefferts answered November 16, 1886, that the growth was a papilloma, and that there was no reason why it should not be radically extirpated, although he did not think this could be done per *vias naturales* in a child only 5 years of age, and suggested thyrotomy as the best means to that end. He added, "I have never seen, heard or read of a papilloma of the epiglottis".

My reply to this, was to send him the growth that had been removed from the epiglottis and preserved in a solution of chloral.

He wrote me again January, 1887, stating that the gross appearance of the little tumor sent him certainly resembled papilloma, but that his eyes then debarred him from the use of the microscope. On January 11, 1887, the case again

returned with oppressive breathing, and the larynx refilled with a cauliflower excrescence. Removal per *vias naturales* was followed by relief. This time I could not remove all the growth, and on January 23, at 12:30 A.M., I was summoned to go to the boy a mile in the country. On my arrival, I found the resident physician of the Confederate Soldier's Home, Dr. Franklin, endeavoring to resuscitate an apparently dead body. There was no perceptible respiration, the pulse could not be detected at the wrist and the only evidence of life was a feeble heart beat.

I opened the trachea by the inferior method of tracheotomy as rapidly as possible. When the air was admitted there was no inspiration and no cough from irritation of the trachea. Artificial respiration was commenced and kept up continuously about three hours. Any cessation of it was followed by disappearance of the apparently restored respiratory action. The trachea was opened at one o'clock, and consciousness returned about 8 o'clock A.M. The boy recovered rapidly from the effects of the asphyxia and the operation, and two weeks later came to my office. I removed the growths again, and repeated the operation several times in the next six weeks. Each operation seemed to be followed by rapid repullation of the growths, and in March they projected above the level of the cartilages of the larynx preventing the epiglottis from closing the latter. They also

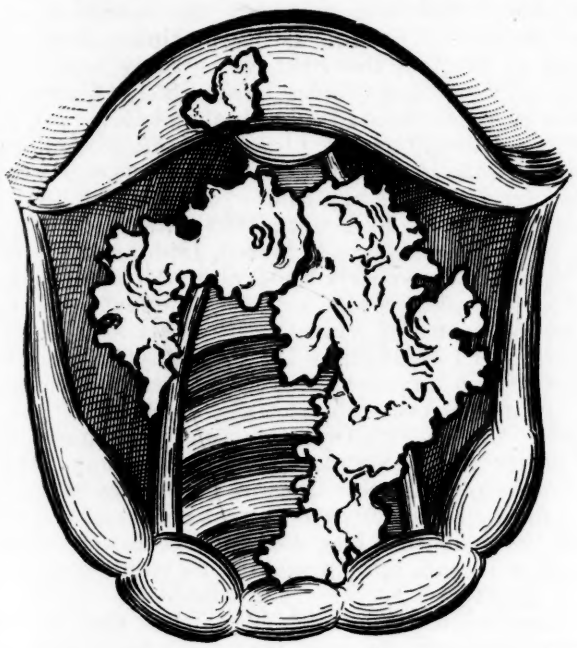

Fig. 2.—In November, 1886.

extended sub-glottically down to and out of the tracheal opening when the tube was removed to be cleansed. I several times passed a wire loop through the external opening in a small rubber tubing up and out through the mouth, cutting off pieces of the growth from the sub-glottic region. I have also seized them, and drawn them out through the opening in the neck. These operations were repeated from time to time until I filled a half ounce bottle with the tissue. Microscopic examination months after showed the character of the tumors to be unchanged.

At last I became disgusted with my results. I recognized that the more I meddled with the case the more abundant became the pathological formations. Several times I was about to adopt Dr. Leffert's suggestion to perform thyrotomy, but I was averse to doing this, as the voice invariably suffers, and I was not satisfied it would prevent a recurrence.

During the summer of 1889 I was absent a great deal. The boy came to my office and missed me several times, so that two or three months passed without my seeing him. When I did so, I noticed the mass had diminished in size. So I concluded to let him alone as far as instrumental interference was concerned. He came to see me now and then. I did nothing but look at his larynx and use a simple astringent spray. Under this "do nothing treatment" he generally improved, the mass constantly diminishing until the larynx began to assume something of a normal aspect.

The growth on the under side of the epiglottis also diminished *pari passu* with the laryngeal neoplasms. In April, 1892, I exhibited the case to the Richmond Academy of Medicine and Surgery, several members of which who give some attention to laryngology examined him. His condition then, as now, was an almost perfectly normal larynx, with white pearly cords, a small projection on the epiglottis at the seat of the former papilloma, and a larger remnant of the growths on the anterior wall of the trachea just below the commissure. He still wears the tube on account of the latter abnormality. I am afraid to remove it until this disappears. But instead of a full tube, he wears only a piece of a hard rubber tracheal canula, cut off just long enough to keep the opening in the neck patent. At night he wears the inner tube—in the daytime he removes this and keeps the outer tube closed with a cork; and when thus corked up he can breathe well and speak distinctly, the voice being strong and natural. To hear him speak one would not know he had a tube in the neck.

This case is especially interesting for several reasons:

1. It is, as far as I can discover, the first case on record of papilloma of the epiglottis, for although Uchermann reported a similar case to the Christiania

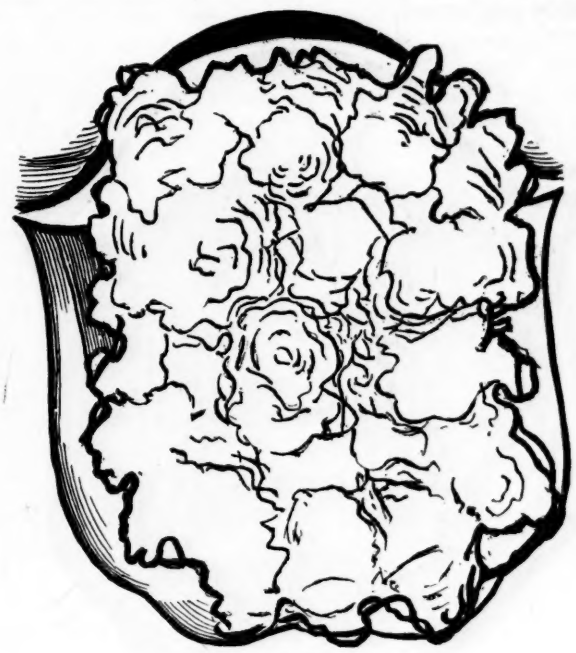

Fig. 3.—In March, 1887.

Medical Society in 1889,[1] the date of my correspondence with Dr. Lefferts antedates this report fully two years. In his case the growth originated from the epiglottis and vocal cords in a child 7 years of age, who had been aphonic four years. He extirpated it entirely in six sittings, and had a perfect result with no recurrence.

Eliasberg in 1889 also reported one of secondary papilloma of the epiglottis in his case of recurring papillomata of the larynx in the case reported below. Dr. Louis A. Bull, of Buffalo, N. Y. (*Jour. of Ophthal., Otol. and Laryng.*, July, 1889), records a case of what he calls papilloma of the epiglottis and base of the tongue, but it appears to to have been an overlapping of the lingual tonsil.

2. It is the sixth case in literature of spontaneous cure of recurring multiple papillomata of the larynx after tracheotomy, the other five being two cases by Prof. Oertel, quoted by Hoppmann (*Volkmann's Sammlung. Klin. Vorträge*, No. 315); one by G. Hun-

[1] See report of the Christiania Med. Soc., Medicinsk Leistabs Forhandlinger, 1889.

ter Mackenzie (*Lancet*, April 6, 1889); one by Eliasberg (*Meditzinskoia Obozrenie*, 1889, No. 1, p. 46); and one by Garel (*Annales des Maladies de l'oreille et du larynx*, June, 1891). In Mackenzie's case the boy was 5 years old, and wore the tube one year after the operation, which was done in 1883. Eliasberg's case was a boy 10 years of age. Thyrotomy was performed in 1887, a mass of polypoid growths removed and cauterized with Paquelin's cautery. In February, 1888, there was a recurrence. In April following thyrotomy was again performed. In June there was a second recurrence, occupying vocal cords and epiglottis. In June, 1888, alarming asphyxia necessitated tracheotomy, and a month later the neoplasm filled the larynx. Two months later this began to improve, and in December nearly all the growths had disappeared.

The canula was worn until March, 1890, when it was removed, as it caused irritation with bleeding granulations about the wound, and cough. The voice became very harsh because of the thyrotomies previously performed.

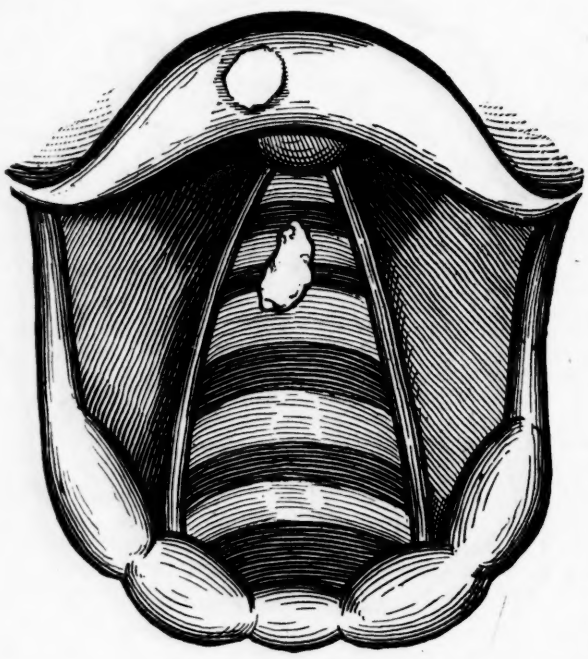

Fig. 4.—Status Præsens.

Garel's case was a girl of 4 years who was tracheotomized after an attack of suffocation June 11, 1890. The presence of papilloma in the larynx was demonstrated by laryngoscopic inspection. The tube was removed July 30, forty-nine days after the operation, all signs of the growth having disappeared.

Garel also speaks of another case in which he did tracheotomy on a boy 11 years old for presumed growth in the larynx, but as he was unable to see into the windpipe, the diagnosis was doubtful. In all of these cases there was the same result, a spontaneous disappearance of the growths, following tracheotomy, although in each one the tube was worn during a different period. Garel's case was the shortest (forty-nine days), and mine was the longest (five years). Eliasberg's case resembled mine more closely than any of the others.

There was the same tendency to repullation of the papillomata after each attempt at their removal, the same enormous development of the growths almost immediately following the tracheotomy, and the same gradual shrinkage of them when all operative interference ceased.

3. It shows that the tracheal canula can be worn indefinitely without secondary paresis of the vocal cord, or impairment of the voice, and that in such cases it is best not to be in a hurry to remove it, because of the probable development of tracheal polyps after the operation. In this case they developed even after the larynx was clear of any abnormality, and he still retains the tube, because there is a small remnant on the anterior wall of the trachea.

These growths are of two kinds: 1. Vegetations existing whilst wearing the tube and retarding its removal; and 2, growths appearing after removal of the tube and healing of the wound; but the latter danger is only to be feared when we are in too great a hurry to get rid of the tube. Sometimes if their pedicle is weak they may be coughed out, otherwise a secondary tracheotomy may be necessitated by the consequent suffocative spasms, and death may result from one of these attacks before the operation can be performed. That this is no imaginary danger is shown by the fact that over twenty cases have been recorded, by Gigon (*Union Med.*, 1862), Wanscher (*These de Copenhagan*, 1877), Archambault (*France Med.*, 1879), Voight (*Jahrb. fur Kinderheilk.*, 1882), Kock (*Arch. fur Chirurg., t. xv*), Waldsberg and Reedel (*Deutsh. Zeitsch fur Chirurg., t. xv*), Kohl (*Tese de Zurich*, 1887), Hume (*Cleveland Med. Gaz.*, 1886), Revilloid (*Rev. Med. de la Suisse Romande*, March, 1891), and others.

The risk of a too early removal of the tube is also shown by a case recorded in one of the last numbers of THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, April 30, 1892, by Dr. F. G. Raynor. A girl of twelve with laryngeal growths was tracheotomized during an attack of suffocation by Dr. Sherwell, Nov. 9, 1889. On the 20th, thyrotomy was performed and the larynx thoroughly cleaned out. Two days after the tube was removed. June 5, 1890, seven months after, she died in a suffocative attack before assistance could be obtained. Had the tube been worn long enough to be sure there would be no recurrence, the result might have been more favorable.

4. The result in my case helps to show the advantage of tracheotomy over thyrotomy in recurring papillomata of the larynx. Some writers claim the latter operation to be free from danger to life and even to voice if properly done, but I doubt if statistics bear out this assertion.

A. Malthe (*Norsk Magazin for Lagevidens-Kaben*, 1886, p. 490), reports a case in a four year old boy of multiple papilloma of the larynx tracheotomized June, 1883. On August 15, thyrotomy was performed to remove the growths, and on August 20 the child died. Salzer (*Langenbech's Archives, Band 39, Heft. 2*), in his report of the laryngeal operations in Billroth's clinic from 1881 to 1889, records ten cases of thyrotomy with three deaths. These references prove it is not free from danger to life, and it is an untenable claim made by Shalita of Kiev (*Uratch*, 1889, No. 17, p. 389), that it will not affect the voice if properly done. I doubt if any of us has ever performed it without detriment to the voice.

Bornemann (*Deutsch Med. Wochen.*, 1891, No. 15), in reporting four cases of multiple papillomata in children from B. Fraenkel's clinic in Berlin, in three of which thyrotomy was done, and in one (6 years old) an endolaryngeal operation was successfully per-

formed, claims that the latter method is preferable to the former, because of the danger to voice and life from thyrotomy. Tracheotomy has the great advantage over thyrotomy that it gives perfect rest to the larynx, by temporarily suspending its respiratory functions, thus in all probability removing some irritating factor in the redevelopment of the growths, whilst guaranteeing unimpeded respiration without risk of suffocation.

Thost ("*Ueber papillom in der oberen Luftwegen*" *Deut. Med. Woch.*, May, 1890), in a capital article on this subject, states that papillomata of the larynx in children will always disappear spontaneously if let alone, that it is benign neoplasm, and without danger. If this is correct, why should thyrotomy with its attendant risks to life and voice be performed? Is is it not better to let such cases alone, merely keeping them under observation to guard against suffocation from any sudden or unusual excessive development. It is only in these exceptional cases that tracheotomy is called for, and it will be all the surgical interference required. Malignant growths in children are rare and these proliferations of the mucosa, as papilloma are claimed to be in contradistinction to organized tumors, are comparatively free from danger. Their causation is uncertain, but any direct irritation of the laryngeal mucosa can produce them. Probably they often result from naso-pharyngeal secretions dropping into the larynx at the arytenoid space, and which not being coughed away, act as a local irritant.

Lennox Browne ("*A case illustrating the possibility of hypertrophy of the pharyngeal tonsils being an etiological factor of papillomata in children*," *Brit. Laryng. and Rhinolog. Ass'n.*, Nov. 1890), reports a case upon which he bases an argument to show that adenoids of the naso-pharynx are a factor in their production. This is probably true, as adenoids are accompanied by considerable secretion which may drop into the larynx, and keep up a prolonged irritation of the mucosa.

CATARRH OF CHILDBEN AND THE IMPORTANCE OF EARLY TREATMENT.

Read in the Section of Laryngology and Otology, at the Forty-third annual meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY LOUIS C. CLINE, M.D.,

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In this paper I wish to consider briefly, nasal catarrh as met with in children, and characterized by an inflammation and purulent discharge from the nasal and naso-pharyngeal mucous membrane.

The word catarrh in the sense that it is ordinarily used, is a kind of cloak to cover up our lack of knowledge of the true inwardness of these cases.

The literature on this subject is rather confusing and unsatisfactory.

MacKenzie recognizes two forms,acute and chronic; under the acute form, he classes the gonorrhœal and leucorrhœal infection that may occur in the new born.

Frankle describes but one form, the acute. Cohen is inclined to attribute all cases of purulent discharge to remote specific infection. Lennox Browne, Sajous, Seiler, and Robinson, make no special mention of purulent discharge in children, but class it along with other cases and hypertrophied glandular structures.

Bosworth in his recent work, devotes a small chapter to purulent catarrh of children, in which he takes the ground that "it is purely local in character, and depends on no constitutional taint, and consists essentially in an increased secretion of mucus in the earlier stages, together with a rapid desquamation of the epithelial cells, which runs its course as a purulent disease in from five to ten years, developing finally into atrophic rhinitis."

In children up to the age of 12 to 15, epithelial structures are especially liable to take on diseased action; we see this manifested in the frequent hypertrophic condition of the glandular structure of the naso-pharynx; whereas in adults, the inflammation of mucous membrane results in hypertrophy of the connective tissues.

During childhood, the lymphatic system undergoes its greatest development: hence it is, that the lymph glands are more prone to alterations of nutrition than in adults.

In children there is great activity in the development of epithelial cells, and when stimulated from any cause, may lead to one of two distinct results. Ist, they may pile themselves upon each other and so adhere as to form a true epithelial hypertrophy, together with an increase of lymph tissue and lymph corpuscles, as in the case of adenoid growths and many enlarged tonsils; this form is likely to follow scarlet fever, measles or diphtheria. 2nd, the epithelial cells may fail to adhere and result in a rapid desquamation, with an increased flow of mucus, forming an abundant muco-purulent discharge.

Both these processes may go on in the same case, or desquamation from the turbinates may follow the adenoid growths in the vault.

My observation leads me to believe that children of a strumous or scrofulous diathesis are more prone to take on the second form, or exfoliation of the epithelial structures.

An acute cold of a child differs from that of an adult, in that the inflammation involves the epithelial coat and naso-pharyngeal glands, thus producing nasal-stenosis; while in the adult, the inflammation involves the mucous membrane proper, extending into the deeper structures.

These inflammatory changes commence as a rule, in children between the ages of three and five years, and if not cared for, will culminate in one of two results, or may be, a combination of both: viz., the desquamative or suppurative form, or the coalescing or adenoid form.

If the case is confined strictly to the desquamative variety, it will gradually extend into the mucous follicles and rob them of their epithelial lining and destroy their secretive power, and in this way lead to formation of crusts, and finally terminate in atrophic rhinitis, about the 14th or 15th year.

The characteristic symptom of this disease, is a muco-purulent discharge from both nostrils, usually of a cream or straw color, and can be diagnosed from the other varieties by there being no special obstruction to the nasal passage, except the accumulation and drying of the secretions. In case of a foreign body the discharge is always confined to one side. In syphilis and in cases of necrosis, the discharge is very offensive. When the discharge is due to adenoid growths, the first thing noticeable is the marked

altered condition of the voice, which is not changed on removing the secretions. In these cases, large quantities of tenacious mucus are found in the naso-pharynx. In those cases in which the adenoid growths are large enough to materially obstruct the naso-pharynx, the discharge makes its way through the nose: this, with the characteristic facial expression, muffled voice, together with careful inspection with the rhinoscopic mirror, will be sufficient to make a correct diagnosis.

In a list of twenty-five carefully noted cases that have applied to me for treatment for nasal catarrh during the last year, five were suffering from a purulent discharge due to exfoliation of the epithelial coat. Three were due to foreign bodies, one to a fibrous tumor, sixteen to adenoids in the vault and enlarged tonsils,etc. Hearing was impaired in twenty-one of these cases directly in proportion to the degree of stenosis, and the length of time the difficulty had existed. Suppuration and rupture of the membrana tympani had occurred in six of these cases; three of these followed the grippe. Seven had developed after having measles, five after scarlet fever, four followed diphtheria, and five gave a history of repeated colds.

Thus we see, out of the above twenty-five cases, only five were found to be strictly catarrhal. The other twenty were complicated with and continued by adenoid growths, enlarged tonsils, foreign bodies, etc. These children were all well cared for, and properly clothed.

A peculiar feature of these cases is that the sixteen cases that had enlarged tonsils and adenoids in the vault, all followed either diphtheria, scarlet fever or measles; while the five purely catarrhal cases gave no history of these diseases but all gave evidence of a strumous or scrofulous diathesis with frequent colds.

I have purposely avoided confining my remarks in this paper to any special variety of cases, but have included all cases that have applied for catarrhal treatment, and from a careful study of these cases, I have thus far reached the following conclusions:

That hypertrophied turbinates, adenoids in the vault, follicular pharyngitis, and enlarged tonsils, are very liable to follow diphtheria, measles and scarlet fever, while the exfoliation of the epithelial coat or the purely catarrhal variety, is more likely to follow repeated colds in the strumous or scrofulous children.

If these two points were more carefully studied by the general practitioners, and less advice, such as consoling the parents and themselves that the child will soon outgrow the difficulty, there would be fewer death certificates to sign, and fewer seeking ear trumpets when older.

When we consider that the treatment involves no risk to the patient and that these growths are the seat of repeated attacks of acute inflammation which is liable to extend to other organs, as the ear, is sufficient evidence that we should not wait for nature to effect a cure through absorption and atrophy.

While there is a tendency to glandular atrophy, at puberty, they seldom entirely disappear, but remain as a constant source of naso-pharyngeal catarrh. The fact that these patients get better after they arrive at the age of puberty, is largely due to the arrest of glandular growth, and the great development which takes place at this age, causing the enlargements to occupy less space in the air passages.

As a rule, we are warranted in giving a favorable prognosis in these case, even when extensive ear complications have set in. In fact, many cases do not apply for treatment until the ears become involved.

The treatment of these cases embraces general and local, to which I will refer briefly. Constitutional treatment with tonics and cod liver oil, is indicated in cases where the general health is impaired by imperfect oxygenation of the blood and disturbed sleep from interference with the normal respiratory functions.

The local treatment in the purulent variety consists in some mild alkaline solution to keep the parts clean of the muco-purulent discharge, followed by some slight astringent. The cleansing lotions are best applied with a small hand atomizer. Douches are objectionable as a rule.

The cases should be watched and the treatment changed as the case demand.

In those cases of glandular hypertrophy, unless seen in the beginning, nothing short of surgical interference and a thorough extirpation of the offending structure will effect a cure.

This is best done by cutting instruments or snare. Owing to the prejudice of many to surgical operations, we are compelled to resort to chemical agents and the cautery for the destruction of these growths. I prefer using the galvano-cautery when not permitted to use cutting instruments, but complete extirpation by surgical operation is always to be preferred to any other method.

The general law of surgery applies to all of these cases, when there is an offending obstruction, the sooner it is removed, the easier the cure and the less liability to complications.

Discussion.

Dr. Casselberry, Chicago:—The term "catarrh" is objectionable as defining too little, as referring to its symptom merely of discharge or disturbance in the upper respiratory tracts; we should seek to become more explicit in our nosology and this the author of the paper has done, by well describing the various forms of rhinitis, etc., and their causes, still another such cause I would suggest to be not infrequently a nasal rhinolith or calculus which may form during an acute attack and then perpetuate the disease.

Too much stress cannot be laid upon the importance of treatment in children, because irreparable damage to the ear is still deplorably common simply from neglect, or inefficient treatment. I believe all such cases to be capable of cure if promptly and effectively handled.

With young babies, who suffer frequently from purulent rhinitis, the result of infection by the vaginal discharges during birth or otherwise, I advise thorough cleansing with an antiseptic and alkaline lotion, such as Dobell's solution, injected into the nostrils by means of a syringe; a medicine dropper may be made to serve as a substitute for a syringe in the hands of the nurse or mother. Sprays, I find to be too slow in use and to frighten the child. Adenoid vegetations should be removed, but the naso-pharynx seems to be an active absorbing surface and the galvano-cautery among a mass of adenoids, is apt to produce such a large necrotic eschar that I have had several cases of septic infection follow its use. Hence, I prefer the cutting and scraping operations. Many mild cases can be done by the finger nail; others by cutting forceps or curettes, rapidly or by repeated sittings with or without a general anæsthetic. Many children, by proper management, can be induced to tolerate the operative treatments; others cannot and then ether anæsthesia may be employed.

To be more explicit regarding the cases for operation under ether: 1. When the faucial tonsils should at the same time be removed. 2. For the removal of large hard dense fibrous adenoids—those not readily scraped away by the finger or curette. 3. Those in which it may be expedient to use a general anæsthetic on account of the unwillingness of parents to see their children suffering and bleeding while

conscious. The risk of anæsthesia is less than the damage liable to ensue if the "avenoids" are not removed at all.

When ether anæsthesia is complete, the child is held in a sitting position by an assistant, the mouth held open by a gag, the faucial tonsils first removed by a cold wire snare which is armed by a steel wire, heavier than usual, so that it will maintain the contour of its loop. This is placed against its tonsil and the tonsil then drawn outward and steadied by a volsellum. This snaring can be rapidly done, without hæmorrhage. Guided by the finger its adenoids are then removed by cutting forceps. At times of active hæmorrhage, the child can be inclined forward for a couple of minutes so that the blood will flow out of the nose. The whole operation need not occupy over half an hour and there is little soreness following it. The results are highly satisfactory.

Dr. John North, Toledo, Ohio:—I do not like the term catarrh. Catarrh is simply a symptom of some other trouble, either constitutional or local. In these cases of purulent catarrh we find some cause that acts upon the cells, we find in the second layer of mucous membrane, if these cells become ripe in a healthy membrane they form the epithelial cells, if from some cause they are modified they are thrown off from the membrane as mucous corpuscles, if they are abated in the development they become pus corpuscles.

Where there is enlargment of the so-called lymphatic tissue of the upper respiratory tract, I get good results from the local application of 60 grains of sulphate of copper to the ounce of water. I also give some form of the iodides. Iodide of iron if necessary or iodide of ammonia.

Dr. H. W. Loeb, St. Louis, thoroughly agreed with the writer in his designation of the causes of nasal catarrh in children and also in his statement as to the importance of its early treatment. In the removal of adenoid vegetations in the vault of the pharynx, he has been accustomed to perform it very frequently without the use of an anæsthetic. A small portion is removed every second day and thus far the result has been satisfactory. No pain is necessarily occasioned and patients readily submit to such manipulation without resistance.

Instead of using a cold wire snare, the Doctor has used a galvano-cautery snare, which he has devised and which permits the removal of the tonsil in a very short time, no hæmorrhage resulting.

Dr. Waxham said: The papers to which we have listened have been so excellent that I hesitate about taking part in the discussion, but there is one thought to which I would give expression. I must confess that I am skeptical as to the occurrence of a simple croupous rhinitis independent of diphtheria. A case coming under my observation led to this skepticism. A patient, nine years old, was brought to my office with a well marked membrane in one nasal cavity which ran the usual course and without extending to the other nasal cavity or to the pharynx. As there were no constitutional symptoms, no fever and no rise of temperature, the case was not isolated as it was considered not contagious. In a few days a young infant in the family developed genuine diphtheria, involving both nasal cavities, the pharynx and the larynx, proving fatal. This case, I confess, has made me extremely skeptical as to the non-identity of croupous and diphtheritic rhinitis and has convinced me of the necessity of isolating all cases of membranous rhinitis.

Dr. DeVilbiss of Toledo:—I object to the effort that is being made to drop, or do away, with the word catarrh, for it is a word that is familiar to everybody, and it is the name catarrh more than any other that influences the laity to seek advice for their maladies. It is the business of the specialist to look into the cause and not stop to quarrel with the name. Therefore I am pleased with the term as used in the paper, and am opposed to dropping the word catarrh until it is demonstrated that there is a word that will more fully meet the indications.

PHENACETIN is said by Dr. Green to diminish the frequency of calls to urination in elderly people, especially at night, and that ten grains at bedtime will often secure rest for those who habitually rise once or more during the night.—*Universal Medical Magazine.*

HYPERTROPHY OF THE ANTERIOR TIP OF THE MIDDLE TURBINATE BODY OF THE NOSE.

Read in the Section of Laryngology and Otology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY G. V. WOOLEN, M.D.,
OF INDIANAPOLIS, IND.

There is a class of symptoms connected with many cases of catarrhal disease of the nose which is ordinarily taken to indicate the disease in its totality, but not regarded as having any special signification. I refer to frontal and basilar headache, deep orbital pain often bilateral, and not unfrequently unilateral, when it is termed hemicrania; mental hebitude, sometimes associated with defective memory, and again bordering upon melancholia, migraine, epilepsy, etc.

Now we do not have these symptoms in childhood, where we find the disease uncomplicated, either as suggesting conditions which would create the disease, or with those resulting from it as usually witnessed. Therefore we must look farther for their correct signification.

They have been regarded as gastric in origin, and as gastric catarrh so commonly accompanies the nasal and throat trouble, it is easily misleading. But closer analysis will reveal that many subjects of the gastric complication do not have the symptoms, and *vice versa*.

This analysis will also reveal that all of these conditions expressed by this category of symptoms, center in those of deep orbital and supraorbital pain or neuralgia with frontal and basilar headache. Now what can the ordinary catarrhal process have to do with this condition of affairs?

It is well known that not all cases of catarrhal disease have these manifestations. And in fact, many attended with the most direful results, both atrophic and hypertrophic, leading to grave pulmonic and other lesions, are wholly without these symptoms. And yet, in the whole range of disease this combination of symptoms is not so marked or persistent as is found in many cases of nasal catarrh.

Why neuralgias of the first division of the fifth nerve exist unilaterally (hemicrania), or bilaterally from the supposed gastric and other causes, and not of the other divisions, is not heretofore explained.

In a paper entitled "Nasal Differentiation," presented to the Mississippi Valley Medical Society in September, 1889, and subsequently published in THE JOURNAL of this Association, I called attention to a full and complete appreciation of the anatomy and physiology of the parts as essential to a correct interpretation of the pathological conditions of the nose.

The text-books on anatomy describe the nose as the organ of the special sense of smell, and would lead us to believe that it was primarily for that purpose; whereas one may have good health and not be capable of smelling at all. But one cannot be well and not use the nose for respiration and as a conduit for secretions from it and the accessory cavities. That which spoils the nose for this purpose is that which leads to obstruction and pressure irritation with defective drainage. In the great majority of cases this is hypertrophic disease.

In the paper referred to, I attempted very briefly to locate the pathology of the symptoms heretofore

enumerated to the ethmoidal region, and more especially to hypertrophy of the anterior tip of the middle turbinate, or lateral process of this bone.

Much has been written about hypertrophic disease of the nose in relation to the catarrhal process, but the inferior turbinates have received the greater attention, manifestly because their enlargement interferes more with the respiratory act and general drainage of the nose. But one of the commonest results of this hypertrophic process is enlargement of the anterior tip of the middle turbinate. This may be unilateral or bilateral, and associated with or without corresponding disease of one or both of the inferior turbinates. It may occur also without further hypertrophy of the middle turbinate—largely so according to my observation, and appears as a globular or oval bright-red, glistening mass, filling the naris in the upper region according as the hypertrophy is uni- or bilateral. These may at times be pale and shrunken or at others very red, irritable, completely blocking the naris. Indeed, this irritable congested condition may be found confined to one side only, and when so, the pain and neuralgias are located on that side, while the other may be wholly quiescent.

When the hypertrophies are bilateral and of equal size the septum remains central, otherwise it is deviated to the side opposite the mass, and is frequently found pressing against the outer side of the naris, causing as much pressure and irritation in it, as does the hypertrophy on the opposite side.

The question as to why a hypertrophy and a corresponding deviation opposite, whether the deviation is due to presssure from the hypertrophy, or that the hypertrophy is due to nature's effort to fill the cavity or vacuum caused by the deviation, seems to me unsettled. Probably the former. It is scarcely the result of traumatism and consequent breaking down of the septum in these parts, as it is too well protected by its outer bony coverings.

These hypertrophies being situated so far anteriorly, do not interfere with smelling unless the whole turbinate is involved, and then probably only in the later stages, when the atrophic process or polypoid degeneration obtains. To fully appreciate the disturbances resulting from this phase of disease one needs to review the outlines of the anatomy of this region.

The naris in its perpendicular axis is an irregular oval cone, with apex between the orbit and perpendicular plate of the ethmoid. The apex of this cone is broken into an uneven surface by the opening of the ethmoidal cells through which the frontal sinus discharges. In health the lateral mass of the ethmoid, which forms the outer side of this cone, and by its projection into the naris forms the middle turbinate body, diminishes in its anterior termination to a flattened projection slightly overhanging the opening of the ethmoidal cells, called the infundibulum. This projection is scarcely or not at all visible with our best means of nasal illumination and inspection.

These immediate parts are devoid of anything of further anatomical or physiological interest, except the nerve of sensation of the anterior region of the nasal cavity, the nasal, a branch of the ophthalmic or first division of the fifth, which enter the naris at its apex, from the cranial cavity, having given off in the orbit its own branches, the ganglionic, ciliary and infratrochlear. It divides into two branches which descend on the septum and outer wall of the naris. This nerve in its relation to its own branches, and as a branch of the first division of the fifth, if disturbed, gives the solution doubtless to much that we already have hinted at, *i. e.*, orbital and supra orbital neuralgias, frontal and basilar headaches following the fifth nerve, hemicrania, when only one is involved, etc. In other words, it is only a question of pressure irritation of this nerve. The blood and nerve supply to these parts being so intimately associated, it could not be otherwise than that they would be similarly affected, *i. e.*, when the nares were irritated and congested, a similar condition would prevail in all contiguous parts. Thus it is that many eye cases are now relieved by the nasal treatment.

When this special hypertrophy obtains and causes irritation, it is by its development between the branches of this nerve, therefore pressing injuriously in both directions. The pressure may be greater on the opposite side, however, from the extreme deviation of the septum and consequently the hemicrania and symptoms of distress will be on that side equally if not greater, than on the side of hypertrophy.

As a local point of reflex irritation, one would expect it to act favorably in the production of such troubles as epilepsy, and in a number of cases in which the fixed point of irritation seemed in this region, I have found this pathological condition to prevail, and upon its removal, immediate amelioration invariably occurred and apparent recovery in at least fifty per cent. of cases.

These hypertrophies, however, may exist without causing trouble when there is an abundance of room in the region of the naris. As a fact, it is not always the size which determines the gravity of the symptoms. A roomy naris may tolerate a large growth with impunity, and conversely a small one may not tolerate a small growth.

It is only when we have pressure that inconvenience follows. That this pressure is greatly hurtful in many of these cases by obstructing the outlet of the ethmoidal cells I have repeatedly proven by removing the greatly enlarged and overhanging turbinate tip and witnessing the retained secretions flow out through the infundibulum into the nasal cavity. This is also frequently seen in the subsidence of "a cold in the head."

The retention of these secretions accounts additionally for the deep orbital and ethmoidal pains encountered in this class of cases.

This blocked and congested condition of these parts unavoidably affects cerebration and furnishes a satisfactory solution of the cause of the mental hebetude, melancholia, and defective memory. The shrinkage of the obstruction either by cocaine, local treatment, dry weather, change of season, or climate, gives relief, and more positively than these, the removal of the obstruction brings permanent relief, apparently a positive proof of the causative relationship. There is nothing that I do in rhinological practice with such certain expectation of success as the removal of these masses for the relief of these symptoms.

In this connection I will state that I have invariably noticed the congestion of the nose in the ordinary "cold in the head" begins at the tip of this turbinate, if seen sufficiently early.

This hypertrophic tip is prone, in some cases, to

undergo polypoid degeneration, prior to, and even without the other portion of the turbinate, at all, and when removed will be found to have a transparent apex resting on an opaque base, which shades off into the ordinary hypertrophic tissue, that may constitute the major portion of the mass, and where the whole turbinate is involved in the polypoid degeneration it also wholly undergoes this process.

Dr. Edward Woakes, of London (Nasal Polypi, etc., London, 1887), very ingeniously explains the troubles traceable to this region as arising from ethmoiditis, and claims there is a necrosing process to be found in the greater number of cases in the middle turbinate. However this may be in the English subject, as exhibited in his clinics, I have not subsequently found it to be true in the American, and many of the troubles which he claims arise from disease of the middle turbinate, I think are clearly referable to other regions of the nasal cavity. Furthermore, he claims it to be caused by inflammation of the ethmoid, which is disproved by removal of the hypertrophic tip and consequently pressure irritation and defective drainage, and thereby relief of the various symptoms.

The method of dealing with this enlargement is wholly by the cold snare. If it be as we have shown, an hypertrophy, we can hope to reduce it by no method of medication, and the treatment of these various symptoms has proven in the past to be at most, but palliative.

The part being so intimately associated with the anatomy of the base of the skull, cauterization is not to be thought of, and in fact fatal meningitis has been reported to have followed such practice.

The hypertrophy will usually be found to involve all of the tissues of the tip, so that periostitis and cranial troubles would be easily awakened by cauterization.

If removed properly a tip of the bone is usually included in the mass. To do this completely the loop of the snare should be carried under tip, allowing the canula of the snare to pass anteriorly to the mass and gently pressed in front and above till slight resistance is felt, when it should be held steadily till the loop is brought home. This I always do as rapidly as possible to abbreviate the pain and have never had a troublesome hæmorrhage. If the mass is large cocaine can be used, but if not, it is apt to shrink it so as to let the loop slip over it.

It should be remembered that in a state of health no one is able to place the snare loop over this tip because of its retracted and flattened shape. Usually the upper region of the naris is so filled with the tip that any preparatory antiseptic measures cannot be used, but when the small hæmorrhage which follows the removal has ceased, the parts should be thoroughly cleansed and dressed antiseptically, and healing will occur surprisingly soon, even when the tip of the bone is removed. It is my custom to keep my patient fully under the influence of the bromides prior and subsequent to the operation for several days.

Following the suggestion that colds seem to manifest themselves primarily in this region, it has become my custom, also, as suggested originally by my assistant Dr. Hibben, to remove this mass first when it becomes necessary with other surgical proceedings, so as to avoid exciting sympathetic troubles in this region, and with most satisfactory results.

Discussion.

Dr. Casselberry, Chicago:—I recognize several forms of enlargement of the anterior end of the middle turbinate body.

1. Simple hypertrophy confined to the soft parts.
2. Myxomatous hypertrophy, or degeneration either alone or associated with hypertrophy elsewhere in the nose.
3. Enlargement of the bony-base of the body together with the overlying soft tissues.
4. Necrosing ethmoiditis of Woakes with enlargement and duplication of the body, it appearing like two turbinates side by side with a slit between.
5. Cystic formation of the bone.

The treatment is necessarily surgical. For this purpose I prefer first the snare, but in some instances it is difficult to pass this; then a turbinate scissors, which I devised and described for this purpose, in connection with the radical treatment of myxomata which spring from beneath this turbinate body. Also at times a fine saw of the Roe pattern can be used.

I am not altogether in accord with the writer regarding the exclusion of the electro-cautery in operating on this body. I have made this a part of the treatment of nearly all cases of hypertrophic rhinitis which usually suffer from hypertrophy of the middle turbinate, as well as the inferior body. The only well authenticated case of meningitis following cauterization in the nose, reported by Wagner, of Germany, followed cauterization of the inferior body. Cauterization anywhere in the nose should be done with strict antiseptic precautions, and perhaps greater care, if possible, be used concerning the middle body, but if care be observed to cauterize only at points where drainage will be reasonably good—that is, along the inferior surface of the body, it can be safely done. Too much surface should not be burned as considerable cicatricial contraction subsequently ensues and dry incrustation is certainly a possible result.

Dr. Seiss called attention to the jamming of the *middle* turbinate in cases of sclerosis of the lower scrolls—the respiratory lumen being too wide while the middle body was subjected to pressure. The enlargements are prone to undergo myxomatous degeneration, becoming polypoid in character.

Reported case of lady aged 24, who suffered from great asthenopia, headache, and mental fatigue. On examination a small myxomatous mass was found on the septum pressing against the middle scroll. A number of light galvanocautery incisions were made into the mass, and sedative sprays applied over an interval of some weeks. Complete relief resulted, which at the end of a year continued permanent.

Dr. Randall, Philadelphia, wished to confirm the statements of Dr. Seiss as to the value of cauterization or other treatment of the hypertrophic middle turbinal in some cases of asthenopia. Nasal examination constituted a part of his ocular investigation in such cases and he could report many cases of good result, not so brilliant, perhaps, because he had treated them himself instead of referring them to a more skilled worker. A recent case, seen with Dr. Seiss at the Polyclinic, had shown very marked relief of mental symptoms suggestive of meningeal irritation as the result of cauterization of his middle turbinate.

Dr. Wright, Brooklyn:—Cautery of the middle turbinate bone, I have been accustomed to do with some caution, more from theoretic considerations—of the nearness of the middle turbinated bone to the base of the brain. I am accustomed to do it by means of a fine platinum point plunged into the submucous tissue. When healing occurs the turbinated body shrinks away from the septum and so relieves pressure. This method is only applicable where there is no bony hypertrophy, where the mucous membrane is alone the offending body. Although I also use the nasal snare where the hypertrophy is large and bulbous, I desire to emphasize strongly the danger of taking away too much of the middle turbinated body, as when this is done the base of the skull and the important structures it supports are exposed to the blast of air from below in blowing the nose and in strong expiratory efforts. One such case forms a part of my experience, where severe headaches lasted for several months caused in this manner. Where there is bony hypertrophy to be reduced I have, in a few cases, succeeded in doing so by morticing the under surface of the middle turbinated bone with a nasal trephine and then with strong probe or forceps forcing the inner plate of the mortice outward against the outer plate—in other words the middle portion of the bone is removed and the outer shell left on

each side with the investing mucous membrane on each side.

Dr. J. Walter Park, Harrisburg, Pa:—I can fully substantiate the mental condition in cases of nasal stenosis, due to hypertrophy of the middle turbinated bodies, cited by Dr. Woolen, of Indianapolis, but differ somewhat in its treatment. Mr. S. was referred to me by the Supt. of the State Lunatic Hospital, of Harrisburg, Pa., who was suffering from the incipient stages of insanity and nasal stenosis. Physical examination showed a hypertrophied condition of both middle turbinated bodies, and undoubted suppression of the free discharge of mucous from the frontal sinus. After cauterization and the entire removal of this stenosis. there was an entire removal of the mental symptoms, and the patient at the expiration of seven months still remains perfectly well. I differ with Dr. Woolen (who stated that cauterization caused meningitis and should not be used) and will say that my experience has been entirely with the actual cautery, and have had no bad results whatever from its use.

DISEASES OF THE NASO-PHARYNGEAL PORTION OF THE RESPIRATORY TRACT, THEIR RELATION TO, AND ULTERIOR EFFECTS UPON THE GENERAL HEALTH.

Read before the Section of Laryngology and Otology, at the Forty-third annual meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY P. C. JENSEN, Ph.C., M.D.,
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Late of Chicago, Member of Chicago Medical Society, and American Medical Association.

Mr. President, Officers, and Members of the American Medical Association, Gentlemen:

I here submit for your kind consideration, an article entitled, "The Diseases of the Naso-pharyngeal Portion of the Respiratory Tract; their Relation to, and Ulterior Effects upon the General Health."

My reason for selecting this subject, is because of the practical relation which it sustains to many of the diseases coming under the observation of the general practitioner. But before proceeding farther, I wish to offer an apology to the Association for briefness, as the subject is too extensive to expatiate upon, at any considerable length, in the space here allotted.

Owing to the geographical distribution of nose and throat affections in this country, their prevailing frequency in our large cities, and along the borders of our great lakes, it is an experience of most frequent occurrence to observe the effects of sudden changes of temperature, upon the human organism.

Fluctuations of temperature and humidity with their concomitant barometric variations, are conjointly responsible for the induction of vaso-motor disturbance, causing in the individual, an inequality of the circulation, thereby contributing an influential factor to the production of vascular fullness, and blood stasis of the mucous membrane lining the nasal cavity, involving the inferior and middle turbinated bodies, and not infrequently extending throughout the mucous structures of the naso-pharyngeal cavity. These phenomena and the hyperæmia resulting therefrom, represent the primary deviation from the physiological condition, and constitute the first step in the pathological action that occurs in the process of taking cold. *That a wide-spread* tendency exists, exerting its peculiar influence, in predisposing individuals to take cold, is I believe the common observation and experience of the majority of physicians.

This statement I believe finds confirmation in the fact that a large proportion of the population in our temperate climates, are affected with a mild grade of chronic inflammation of the nasal mucous membrane; chronic inflammation of any anatomical structure, whether it be bone, tendon, muscle, nerve, synovial, serous or mucous membrane enduces in such structure, a hyper-sensitiveness to exciting causes of disease.

Of etiological influences, the sudden alternation of heat and cold, and the transition from a dry to a humid atmosphere, or *vice versa*, are the most influential in the production of colds, coryza, and the development of inflammation of mucous membrane, in any cavity or portion of the body to which such membrane is distributed as an anatomical part.

Of other important etiological conditions may be mentioned debilitating influences, excitement, previous and present disease, hereditary constitution, temperament, age, sex, occupation, etc. But other disturbances and cognizable agents, are circumstantial as exciting causes of disease, the most influential of which are: 1, mechanical influences; 2, chemical influence; 3, mental emotion; 4, nervous influences, and the so-called reflex neurosis; 5, defective sanitation, as imperfect ventilation; cleanliness or drainage; 6, imperfect digestion; 7, defective elimination; 8, excessive or deficient physical exercise; 9, excessive evacuations; 10, the so-called auto-genetic poisoning; 11, and last, epidemic, endemic and infectious poisons.

Owing to the prevailing frequency of chronic mild rhinitis and its existence in many individuals, to whom it is the cause of but slight inconvenience, or it may be scarcely any except when a cold is contracted by one so affected, this chronic process is developed into an acute inflammation. I am therefore disposed to believe, that chronic affections, such as rhinitis, post-nasal catarrh, or naso-pharyngitis, tonsillitis, laryngitis, tracheitis, bronchitis, etc., are the results of repeated colds, or attacks of acute inflammation, but that when a rhinitis once becomes chronic, it assumes the rôle of a predisposing cause in taking cold, by reason of the irritability and supersensitiveness which characterize inflamed structure.

Indeed for this reason an often recurring coryza is a presumptive diagnostic symptom of chronic rhinitis, and should always be supplemented by a rhinoscopic examination of the naso-pharyngeal cavity, in order to determine the differential diagnosis. The results of an exposure to cold, will differ in different individuals according to habit, occupation, degree of exposure, etc., and the course of morbid action will be largely dependent upon dyscrasiæ, susceptibilities, temperament and inherited or acquired conditions, etc. In the majority of cases, the result is an acute inflammation of the mucous membrane, which lines the nasal passages. In others, it gives rise to pharyngitis and tonsillitis.

In some instances laryngitis, tracheitis and bronchitis are developed; while in others, irritable bladder-cystitis, nephritis, oxaluria, lumbago, rheumatism, and neuralgia may occur. This diversity in results upon different people, from exposure to cold, is most readily explained when it is observed that inflammation resulting from an attack of cold locates itself by preference in the weakest part of the organism. To illustrate, an individual of highly nervous temperament, if anæmic and debilitated, when ex-

posed to cold is liable to an attack of neuralgia. A person subject to rheumatic trouble, upon exposure, most frequently contract an attack of rheumatism. If there be a bronchial weakness, an exposure will be followed by an attack of bronchitis, or perhaps bronchial asthma.

The neurotic temperament, predisposes, and the effects of extreme debilitating influences from prolonged mental strain or from physical fatigue, invariably renders the subject peculiarly susceptible to cold in the head. Occupation, such as bakers, blacksmiths, cigar makers, firemen, engineers, furriers, millers and chemists, whose business necessitates the endurance of alternate hot and cold temperatures, or the continual exposure to dust, irritating gases or poisonous vapors, renders the individual especially susceptible to rhinitis or naso-pharyngitis.

The frequent association of such nasal diseases as chronic hypertrophic rhinitis, nasal stenosis, polypus, post-nasal adenoids, hyperplastic and hypertrophic inflammation of the nasal mucous membrane, and their relation to various neuroses as chorea, asthma, paroxysmal sneezing and hay-fever; also the disappearance of the secondary affections upon correcting the nasal abnormalities, suggests causal relation.

Intra-nasal diseases are therefore frequently the cause of a series of secondary affections, the development of which are often anatomically remote from primary cause. These secondary diseases may occur from direct irritation, and continuity of structure, or from reflex action. From the former cause may be mentioned, Eustachian catarrh, acute catarrhal otitis media, pharyngitis, tonsillitis, laryngitis, tracheitis, bronchitis, gastritis, duodenitis, enteritis, etc. While to the latter may be attributed the so-called sensory, motor, or secretory neurosis of peripheral origin as nasal or bronchitic asthma, paroxysmal sneezing and hay-fever, asthenopia, epiphora, conjunctivitis, supra-orbital, hemicranial or trigeminal neuralgia.

The symptomatology of intra nasal disease, both objective and subjective, will depend upon the form of disease present.

In polypus the subjective symptoms are generally those of obstructed nasal respiration, frontal headache, intra-nasal pressure, with a sensation of constriction across the bridge of the nose, snoring during sleep, anosmia, pharyngeal and laryngeal irritation and naso-pharyngitis.

The nasal obstruction may be bilateral or unilateral, partial or complete, or alternately unilateral, according to the anatomical attachment of the polyp, and the nature of the pedicle, whether sessile or pedunculated.

Their history usually dates from a period when the patient experiences increased susceptibility to colds in the head; the attacks repeated with increased frequency, until the catarrhal symptoms of the patient are fixed and constant. Cough, asthma, palpebral and lachrymal irritation, and neuralgia may occur as reflex symptoms more to be regarded as sensory neurosis of peripheral origin; while vertigo, loss of memory and inaptitude for mental and physical exertion, are symptoms to be referred more particularly to the anæmia resulting from interference with respiration, and other blood deficiencies and contaminations, from further secondary implications, rather than to that of reflex irritation.

A profuse rhinorrhea is a common condition, when two mucous surfaces are brought into contact with each other, the effect of which is very debilitating upon the patient. The speech is usually thick and guttural from a semi-paretic condition of the palate, which will be observed to possess the usual characteristics of nasal obstruction.

The symptoms are all more aggravated during damp weather, owing to the hygrometric properties possessed by œdematous structures.

When buccal respiration has been practiced for a considerable period of time, the alæ nasæ, may, from want of use, acquire a tendency to collapse.

The sense of smell is usually seriously implicated, although taste of flavors may be normal. Tinnitis aureum and deafness from catarrhal inflammation of the Eustachian tubes or direct mechanical occlusion of them is not uncommon, nor should it be forgotten that lachrymal abscess has resulted from pressure upon the nasal duct. (Greville MacDonald.)

The symptoms of nasal stenoses, from other causes, differ from those of polypus in this particular: that in stenosis the obstruction is permanent with change of position, which is not the case with polypus.

Obstructive nasal disease aside from its influence over speech, also affects intonation of the voice to a considerable extent. The removal of post-nasal obstruction therefore raises the pitch of the voice, and improves phonation.

The local symptoms of chronic catarrhal rhinitis are of small importance and of little diagnostic value; they are indicative of nasal disease, a rhinoscopic examination being necessary to complete the diagnosis.

The important symptoms are buccal respiration, inability to blow the nose, headache, vertigo, the typical buccal speech, and snoring during sleep, and not infrequently rhinorrhea.

The general symptoms are those of languor, lassitude, and fatigue, which often appear worse in the morning than at night. There is usually present muscular soreness, limited sometimes to groups of muscles, which are symptomatic of systemic depression from mucoid poisons and various pepto-toxines, leucomaines, albumoses and other system poisons.

There is usually a furred tongue, a bad taste in the mouth, or a dry sticky sensation in the throat.

The bowels are usually constipated, and in the majority of cases a strong tendency to melancholia exists; while the closed mouth, fœtid breath, inspissated mucus hawked from the throat more often than blown from the nose, and the speech approximating the cleft palate patient, are associated with the reverse condition, viz.: abnormal patency of the nasal fossæ, and it is in such cases that atrophic changes usually occur. The character of the discharge aside from its degree of inspissation, whether mucous or muco-purulent, is often of little importance if bilateral; but when purulent, or unilateral, it may be of considerable importance, especially as suggesting grave structural disease of the ethmoidal cells, or empyæma of the maxillary frontal or sphenoidal sinuses.

The distinction between mucus and pus can easily be made both chemically and microscopically. Pain is not always important, cough is occasionally a prominent symptom in obstructive nasal disease, and apart from concomitant laryngitis, nasal cough is usually dry and barking in character. The olfactory function is of but slight value in diagnosis, as very

insignificant and imperceptible causes interfere with its performance. Indeed the objective appearances are the only symptoms of much diagnostic importance.

The differential diagnosis between true rhinitic hypertrophy of the turbinated and vascular tumefaction of the erectile tissue is easily accomplished, by the application of a solution of cocaine, which causes vascular collapse of the erectile tissue, but is without effect upon true hypertrophy; vascular tumefaction, also pits on pressure, similar to œdematous structures, which is not the case in hypertrophic tissue.

In all intra-nasal diseases except where grave structural lesions exist such as caries, necroses, exostoses, ecchondrosis, syphilitic ulcerations and septum perforations, the primary or local manifestations of disease frequently disappear with the inauguration of secondary affections.

It is of frequent occurrence to find a hypertrophic rhinitis involving the inferior and middle turbinates to a degree of almost complete occlusion of the nasal fossæ, in a patient who is seeking relief from a bronchial asthma, gastritis, neuralgia, rheumatism or anæmia, when in fact, the information of the existence of a primary intra-nasal disease will be a very great surprise to the patient, who, notwithstanding the fact that the nasal fossæ may be almost completely obstructed from chronic hypertrophy or hyperplastic tissue, declares he experiences nothing wrong in the head, but alludes emphatically to a bronchial cough, or a gastric distress, soreness or distention, or to various areas of muscular soreness or neuralgic sensations, or perhaps, to subscapular or lumbar pains, etc., so that the sufferer's attention is frequently directed from a primary disease, to the distressing subjective symptoms of secondary affections.

The direction in which the secondary disease may extend, will be largely dependent upon conditions, such as inheritance, dyscrasia, peculiarities, predisposition, temperament, occupation, etc.

A normal structure with its perfect performance of function, constitutes the physiological standard of health. Pathology begins by deviation from the normal processes, and relates exclusively to morbid or unnatural conditions in living structures. In other words, it is altered physiology and can only exist in living matter.

The first or primary deviation from the normal standard, upon exposure, is vascular disturbance, and stagnation of blood in the mucous membrane and erectile tissue of the nasal cavity. This leads to swelling, redness of the parts, with increased secretion of mucus, and as the inflammation thus induced subsides, it leaves a slight hypertrophy and irritability.

The repetition of these phenomena, with repeated attacks of colds, coming and going, extending over a period of years, will in most individuals, establish a chronic rhinitis, or naso-pharyngitis, commonly termed post-nasal catarrh.

The continuous and excessive formation of mucus gravitating and trickling down from the post-nasal space into the pharynx, there to be dislodged mechanically and swallowed along with food and drink, will, in due time, initiate pathological fermentation of the gastric contents. The acrid and irritating effect of fermentation products upon the gastric mucous membrane and its glandular structures, will if allowed to persist, establish a chronic gastritis.

In the passage downwards the chyme, with its pathological fermentation products, will in like manner develop intestinal fermentation, irritation and inflammation, and if the cause remains operative, will, by continuous repetition of this abnormal condition establish chronic duodenitis, enteritis, and their consequences.

It matters not how much an individual can eat, if the gastric and intestinal mucous membrane is unable to digest and absorb it—nutrition will of necessity be seriously impaired, and the living bodily structures be deprived of their physical and vital power.

Not only will the system in general suffer the effects of inanition, but additional depression and exhaustion is superinduced from contamination of the blood with mucoid poison, leucomaines, peptotoxines and the products of bacterial and pathological action.

But the function of the digestive tract is not only impaired for digestion and absorption, but it is equally embarrassed in its eliminating activities for the removal of waste products from the system.

The existence of such a chain of morbid derangements upon the system, may eventuate in any of the following conditions, viz.: anæmia-chlorosis, leucocythemia, copræmia, neurasthenia, neuralgia, rheumatism, abscesses, furuncles, carbuncles, eczema, etc., and if a latent strumous tuberculous or syphilitic dyscrasiæ exists, it may be speedily aroused into energetic morbid action, the effects of which further exhaust the system and complicate pre-existing conditions.

Obstructive nasal abnormalities, as polypus, structural stenosis, hyperplasiæ of the turbinates, with vascular tumefaction of the erectile tissue, hypertrophic rhinitis, fibroid growths, post-nasal adenoids, traumatic septum, deflections, etc., are seriously instrumental in the development of inflammation of the mucous membrane of the larynx, trachea and bronchial tubes, by reason of failure in elevating the temperature of the inspiratory current of air to that of the blood, and further by insufficiently moistening the ingoing current, and improperly sifting and freeing it from mechanical irritants.

So that in the complete or partial obstruction, where buccal respiration is compulsory, the air reaches the deeper respiratory passages, at too low a temperature, and in too dry or too impure a condition.

Hence intra-nasal disease stands in causal relation, not only to secondary diseases of the intestinal tract, but also contributes in no small degree in the development of laryngeal, tracheal and bronchial inflammations.

Obstructive nose diseases, are also influential in the causation of various neuroses, such as asthma, paroxysmal sneezing, hay fever and chorea; while catarrhal and general fevers are not infrequently produced from the same cause.

In alluding to the general prevalence of mucous membranous inflammation, both in Europe and in this country, and the great similarity of the endemic form; also the peculiar tendency, and the predisposition which catarrhal subjects exhibited during our late epidemic of la grippe, in contracting the latter with greater frequency and severity than individuals possessing healthy mucous membranes, leads me to believe that there exists some relationship or affinity

between the two affections. In substance the two diseases differ only in the following particulars, viz.: mucous membranous inflammation is more generally endemic, chronic and mild, except where the chronic form is aggravated from exposure to cold into an acute condition, while in la grippe the onset is usually sudden, acute in its course with tardy convalescence, intense in its symptomatology, prone to complications and epidemic in form.

In their pathogeny they resemble each other in this particular, that there is present in both a neurotic and an inflammatory factor; that in both there exist the characteristic features of acute coryza, plus the general febrile disturbance. In la grippe, the lesions are those of catarrhal inflammation of the mucous membrane of the eyes, nose, ear, throat, larynx, bronchi, stomach or intestines; while in simple catarrhal inflammation the process is limited, showing no disposition to invade all the mucous membranes simultaneously. In influenza the severity differs in each locality and in the person attacked; in some the bronchial effects are the most severe, while in others the gastric symptoms are the predominating manifestations. La grippe in itself has not proved to be generally fatal, but increases the mortality of other diseases, thus raising the general death rate. The attacks may be repeated in the same individual while the epidemic is raging, by an ordinary exposure to cold, as in common mucous membranous inflammation. No specific microbe or bacteria has as yet been demonstrated to exist in either the endemic or epidemic form of the disease, so far as I am aware. Although fifteen or twenty different microbes of no acknowledged specific importance have been observed to infest mucous membranes.

To the following authors I am especially indebted for much valuable information in the study of rhinology, laryngology and otology, viz.:

The late Sir Morrell Mackenzie, London; McBride, Edinburgh; Greville MacDonald, London; Francke H. Bosworth, N. Y.; Beverly Robinson, New York; Sajous, Philadelphia; Meyer, Michael, Hamburg; Elsberg, Hack, Freiburg; Beard, New York; Lennox Browne, London; St. John Roosa, New York; Albert H. Buck, New York; Scheck, Munich; Schneider, Cologne; Krause, Berlin; Mygind, Copenhagen; Dundas Grant, England, and others.

AN IMPROVED GALVANO-CAUTERY SNARE; ITS USE IN THE NOSE AND THROAT.

Read in the Section of Laryngology and Otology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY HANAU W. LOEB, A.M., M.D.,

OF ST. LOUIS, MO.

PROFESSOR OF DISEASES OF THE NOSE AND THROAT, MARION-SIMS COLLEGE OF MEDICINE; LARYNGOLOGIST TO THE MISSOURI PACIFIC AND M.K. AND T. HOSPITALS; SURGEON TO THE NOSE AND THROAT DEPARTMENT OF THE MARION-SIMS HOSPITAL AND THE GRAND AVENUE FREE DISPENSARY.

There is a just demand on the part of the medical profession for instruments which fulfil every requirement on the score of precision, efficiency and cleanliness, and just as nearly as an instrument approaches these essentials, so nearly perfect does it become. Furthermore, any change in an established instrument, which causes it to approximate this ideal condition of things, constitutes an improvement which merits adoption.

To any one who has used the galvano-cautery snares now in vogue, the thought must often have been presented that, in spite of the many advantages to be derived from their use, they exhibit many drawbacks which, long since, should have been overcome. So great, in fact, have these shortcomings appeared, that many have discarded the galvano-cautery from their armamentarium, and have adopted instead the cold snare of long ago.

A very considerable experience in the use of the galvano-cautery snare, has caused the writer carefully to consider the evident disadvantages, and as a result of the formulation of his thoughts in this direction, the instrument now presented to the Society was suggested.

In its construction, the instrument is very simple, being made with a view of permitting perfect cleanliness. True, the old snares were thoroughly aseptic so far as the wire was concerned; for that, becoming red-hot, would naturally destroy all germs in contact therewith. But thorough asepsis or even ordinary cleanliness is precluded, in such an instrument, from the fact that, the canula being wrapped with silk or

cotton thread, a drop of blood or a particle of secretion could not be entirely removed, and therefore constituted a first-class breeding medium for all sorts of bacteria. To obviate such a reasonable drawback, the instrument here presented has been insulated with hard rubber, which can be removed with ease from the canulæ at any time and boiled.

The canulæ themselves are readily removable from the other parts of the instrument, and hence are amenable to thorough aseptic preparation. They are a trifle larger than the canulæ ordinarily in use, but this does not in any manner affect their utility.

Another inconvenience, or rather expense, is the great length of the platinum wire which all previous snares necessitate; the average required being about 15 inches, quite a costly item when often broken. In the writer's snare only 3 or 4 inches are necessary. This result is accomplished by passing through each canula a stout copper wire containing an eyelet in

its flattened end. Into this small opening the platinum wire is inserted and the ends bent so that, when the wire is pulled into the canulæ, it cannot escape. There is less inconvenience in threading this little eyelet than in passing the wire through the old canulæ.

An ivory tip similar to those for some time in use, and which is freely separable, completes the instrument.

The snare is applicable to the slide handle made by the McIntosh Battery and Optical Co., Chicago, Ill., from whom, as well as from A. S. Aloe & Co., St. Louis, Mo., the snare may be procured.

The advantages of such an instrument, so manifest upon examination, have been amply and clearly demonstrated in actual practice. They may be stated as follows:

1. Cleanliness, as already detailed. Every portion is removable, the rubber insulator, the two canulæ, two copper wires, the platinum wire and the ivory tip; it is therefore easy to treat them as is usually done with all proper surgical instruments prior to operation. One may readily appreciate the greater satisfaction to the surgeon when he operates with an instrument which he is morally certain is clean, than when he knows that it can never be entirely free from the objection of uncleanliness.

2. Less expense. The platinum wire is not so readily broken, and when it is, may be replaced at a trifling cost.

3. The instrument is firmer, and therefore more easy of manipulation and use.

4. The current required is beyond a doubt considerably less. I have verified this a number of times, and when my storage battery has been out of order, I have, on a number of occasions, used one of the cells, instead of the two which I have found necessary with all other snares.

5. There is no danger of short-circuiting the current. This difficulty with other snares is by no means uncommon; for it not infrequently happens that when a body is engaged and the wire drawn taut, no current passes through the wire and therefore no action results. This is due either to connection of the wires below or to the absence of any electricity passing from the canulæ to the wire above. Such a condition of things is manifestly impossible in my instrument, in which the connection is made and maintained by means of the copper wire and is not at all dependent upon the canulæ, at their orifice.

The improved snare should increase the range of application and use of the galvano-cautery snare in the nose and throat, for it renders operations safe, certain and reliable procedures.

In removing tonsils, more than in any other particular, is this exemplified. Some six months ago I read a paper before the St. Louis Medical Society, describing the operation of removal of hypertrophied tonsils by means of the ordinary galvano-cautery snare. The use of this new snare has fortified my opinion that this is the safest and most satisfactory method for their removal. Tonsils in all conditions of hypertrophy, except when they are thoroughly impacted between the pillars of the palate (even then a small portion may be removed), are excised with more precision and with less danger and inconvenience than by any other method, while pain and the time required are not increased.

The *modus operandi* is simple. After applying a solution of cocaine to the mucous membrane, in order to render it insensible to the presence of the wire and moderately to anæsthetize it, the tonsil is drawn out from between the palatal pillars by means of forceps, and the snare is engaged so that as much of the tonsil may be removed as is desired or desirable. One need never fear that hæmorrhage will result in the adult, or that a portion of the palate in children will be accidentally removed. Bleeding never follows and healing is an uninterrupted sequence. The ear pain and the inflammation resulting from snare operations are no more severe or serious than from the tonsillotome operation. The snare may be used in cases where it is desirable to combine with the cauterization of the tonsil the removal of a small portion of the organ.

Of late, I have been using this snare in removing the uvula, instead of the scissors as I formerly did. The uvula is allowed to drop into the loop, the wire is drawn tight, the current turned on and the uvula removed, no forceps being necessary. I have noticed that in the twelve cases upon which I have thus far operated, the patients were able to eat at the succeeding mealtime, a rare occurrence in previous operations. The explanation would appear to be that the forceps or forks of the uvulotome draw down the mucous membrane so that more of the mucous membrane is cut away than of the muscular tissue, whereby a considerable portion of the latter remains exposed, making the whole organ, very naturally, exquisitely sensitive. Again, the stump, after the cautery operation, is more even, no hæmorrhage takes place and recovery is more rapid.

In the nose, of course, the snare is indicated wherever the old instrument could be used; in the removal of nasal polypi, portions of mucous membrane and of the turbinated bones, it suggests itself. From the certainty of its action and its advantages already given, it should displace the cold snare and the forceps in the removal of polypi—its action is quicker, no hæmorrhage occurs and recurrence is more infrequent. Besides, there is no need of after cauterization as when the cold snare alone is used.

Incidentally I may state that I am having all my cautery points covered with hard rubber instead of the thread or silk which have so long been obnoxious to me on account of the impossibility of keeping them clean. In this way a possible evil is overcome.

In conclusion, I desire to express my thanks to Mr. Lou P. Aloe for kindness and consideration in the development of the instrument which it has been my pleasure to present to the Association.

Since the foregoing was written the following communication was addressed to the writer:

"The snare is certainly possessed of advantages over the ordinary forms, notably among which are greater ease with which it can be cleaned, economy in platinum wire and less ampèrage required in heating. This latter feature showed very plainly when testing yesterday and to-day a new device for the use of the Edison current in galvano-cautery. Twenty ampères of current would not satisfactorily heat the ordinary form of snare; 10 to 15 brought your snare up to proper heat. (Signed) McINTOSH B. AND O. Co.,
C. ALFRED SMITH, Sec'y."

Quod erat demonstrandum.

303 North Grand Ave.

SIR JOSEPH LISTER, having reached the age of sixty-five, the age-limit by the regulations of King's College, Edinburgh, has retired from the clinical lectureship.

COMPRESSED AIR AND SPRAYS IN DISEASES OF THE NOSE, THROAT AND EAR.

Read in the Section of Laryngology and Otology, at the Forty-third annual meeting of the American Medical Association, held in Detroit, Mich., June, 1892.

BY SETH SCOTT BISHOP, M.D.,
OF CHICAGO.

The use of compressed air in the treatment of affections of the nose, throat and ear is so indispensable and universal that it is somewhat remarkable that there should be a poverty of definite literature on the subject of its dosage. Especially is this true with reference to its use in ear diseases, in the treatment of which it is a powerful agent for good or evil.

Among ten of the most prominent authorities on the ear only two give definite information on its proper dosage.

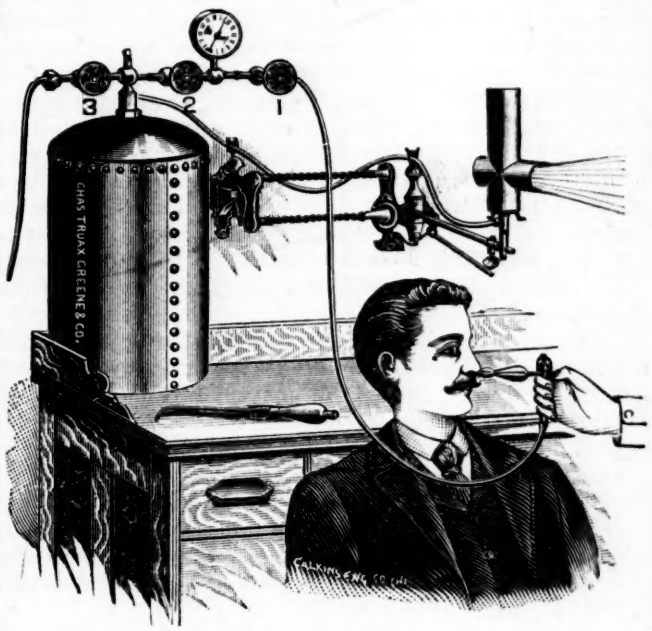
By a series of experiments with the compressed air gauge I have found that the maximum amount of pressure that can be obtained with a Politzer air balloon of the capacity of eight fluid ounces is six pounds; with the six ounce bag the pressure may be made to reach ten or twelve pounds. The difference in favor of the smaller bulb represents the greater advantage one has in grasping a small object. This amount was the maximum obtainable by an unusually strong hand, accustomed for years to compressing air bags handled at the greatest advantage for leverage, that is, with the larger end of the balloon between the thumb and strongest fingers, and the tapering end under the third and fourth, or weakest fingers. As the reverse method is practiced by many aurists, much less force than six and ten pounds must result.

Politzer speaks of ten and twelve ounce bags which are manipulated in Vienna by pressing them against the operator's side, but they are not in our markets. The Gruber balloons, with the opening or air valve at the larger end, might possibly accumulate more force than I have mentioned, by repeatedly compressing them, but on account of the valves being imperfect, or soon becoming useless, I have discontinued their use. Professor Gruber himself prefers the bulb having a perforation in the end to be covered and compressed with the thumb. I have not experimented with this kind, for one could not be found.

The rubber bulb usually supplied by the Davidson company for hand sprays and inflators can be made to exert fifteen or even eighteen pounds, but not by a single compression. However, it is not practicable to employ more than fifteen pounds with the $\frac{3}{16}$ inch rubber tubing ordinarily supplied with Buttle's inflators. A higher pressure distends it, and eighteen pounds ruptures it with a loud report. The thick, firm, white tubes accompanying the De Vilbiss atomizers will stand more, for I have tested them with forty-five pounds without even distending them.

The force necessary to spray the nose and throat is not great. Eight pounds will project continuous sprays of watery solutions or lavoline with sufficient force from the Davidson atomizer. Parenthetically I wish to explain that when I say lavoline I do not mean lanoline, as many journals have made me say. Lavoline is a purified liquid vaseline. About twelve pounds' pressure is needed to produce a continuous and copious lavoline spray from the De Vilbiss atomizer, and it requires thirty or forty pounds to throw a spray of unheated glycerole of tannin.

In adapting the improved compressed air apparatus to the treatment of the ear I have endeavored to devise some means of determining and controlling the force and volume of air, or the dosage. To illustrate the necessity for this I may quote one of my assistants as having recently reported a case of rupture of the drumhead by an aurist who was using compressed air without an air meter to gauge the amount of force used. The employment of compressed air in otology should be placed on a scientific basis. Guessing won't do. Such a powerful remedy as we have stored in our air reservoirs with a hundred pounds pressure to the square inch should be administered with care, skill and accuracy. It can be demonstrated that this is possible.



As the accompanying illustration will show I have accomplished this by placing a pressure gauge between two valves on the escape pipe of the air receiver. This arrangement utilizes the gauge for registering not only the air pressure in the reservoir but also the force of the current of air while it is escaping through the cut-off of the treatment tube.

The whole apparatus used in my experiments, excepting the cut-off, was made by Chas. Truax, Greene & Co., of Chicago. The cut-off used is the Davidson pattern. The only fault in its construction is the violation of the important principle that a right angle should never have a place in a compressed air tube. It is obstructive and should be replaced by a curve.

The meter is used as follows: By opening the outer right hand valve marked 1, by turning the wheel to the left one-fourth of its circumference, pressing the thumb valve of the cut-off and opening valve 2, gradually you may obtain any number of pounds' pressure desired at the cut-off, from one to one hundred. To use ten pounds: with the cut-off and valve 1 open, turn the valve 2 until the index needle runs up to 10. As long as the cut-off remains open the needle indicates 10 pounds. If you close the cut-off the needle rises to indicate the whole number of pounds in the reservoir. Now if you fit a spray producer to the cut-off and open it, the first impulse of the column of air, which is small in volume, is expended in filling the atomizer and starting

the spray. In using the nasal bulb of Buttle's inflator for treating the ear, the first impulse is expended in filling the nasal and superior pharyngeal cavities in addition to inflating the middle ear. The volume of air is so small that the needle drops down to 10 at once and remains there as long as the cut-off is kept open. If no more than this amount is desired the cut-off should be opened before the current is turned on and valve No. 2 should be slowly opened until the needle indicates the number of pounds required. No greater pressure will then be exerted unless the cut-off valve is closed.

When it is desired to interrupt the air current for the purpose of producing to and fro movements of the membrana tympani and ossicles, or to throw jets of volatilized medicine or sprays into the tympanic cavity, it is a simple matter to control the pressure in this way. Let us assume that we want to use, with the nasal-tipped inflator I have adapted to this purpose, three atmospheres, or about forty-five pounds. Valve 1 being opened, apply the cut-off to the nasal bulb containing the medicine on sponges; open the cut-off; turn on twenty pounds with wheel 2 and then close cut-off. The needle rises. Now if the inflator is inserted into the nostril with the patient's nose firmly closed and cheeks fully distended, the instant the cut-off is opened, the needle runs down to 20. Close the cut-off, and the needle mounts to 45 pounds. Open the cut-off at that moment and the needle descends again to 20; close the cut-off and the needle rises; the instant it touches the 45 pounds mark, open the cut-off again and so on; repeatedly opening and closing the cut-off will give repeated impulses at any given pressure.

The resistance offered by the sponges is small—less than $\frac{1}{8}$ of an atmosphere.

A little practice will enable anyone to measure the doses skilfully and to give effective treatments without fatigue.

If very rapid interruptions are required, valve 2 should be opened more freely than in the example given. For forty-five pounds' maximum pressure, about thirty pounds should be allowed for the uninterrupted current. My experience with this method indicates that not more than sixty interruptions per minute should be made in order to produce decided vibratory movements of the drum head and ossicles.

The dose of air for ear treatment varies greatly in different individuals. While fifteen pounds might endanger the continuity of an infant's drum head or one greatly weakened by disease, or the thin cicatricial membranes closing old perforations, I have often applied from sixty to ninety pounds to old thickened and hardened drum heads without doing them the kindness of bursting them.

It is evident that if it requires fifty to eighty pounds in some cases to propel sprays into the middle ear it follows that in such instances rubber air bags are insufficient, for they do not average more than six to fifteen pounds. But with high pressure only a small volume should be used. I would propose the following rule to keep the operator within the limits of safety: The higher the pressure the lower the volume should be. If the density of the air is greater than one wishes to use, even with a minute volume, it is easy to avoid the high pressure when using the nasal tipped inflator by leaving the opposite nostril open during the first impulse, until the needle descends to the proper point. This allows the surplus air to escape by the opposite nostril. The same purpose is accomplished with the catheter by holding the catheter tipped inflator a little withdrawn from the mouth of the catheter while the cut-off is first slowly opened. The surplus pressure then escapes at the junction of the inflator and catheter.

The volume should be proportioned to the density with care in cases of atrophied soft palate so as not to strain the muscles of the throat by too powerful inflations, especially if they are subject to rheumatic sore throat.

It serves a convenient purpose to instruct patients to raise one or both hands every time they feel that one or both ears are inflated. This obviates the necessity of frequently using the auscultating tube.

The warnings against the danger of rupturing the membrana tympani by Politzerization have been freely sounded. I do not know that I have ever ruptured a drum head by compressed air, while I have seen a considerable number that were torn or perforated by blows on the ear. Even in men employed in caissons of tunnels, bridges, etc., where they are compelled to work in an atmosphere condensed under a pressure of forty to sixty pounds, it is rare to find a ruptured drum head. This may be owing to the fact that they are instructed to inflate the ears so as to equalize the pressure on both side of the membrane. In this connection it must not be forgotten that there is always the natural atmospheric pressure of nearly fifteen pounds on the outer aspect of the drum. Notwithstanding this an eminent otologist has asserted that drum heads have been lacerated by Politzer's method.

Professor Politzer says: "During thirteen years only fourteen cases of ruptured drum heads are known. In the case of a normal membrana tympani a pressure of forty-five to sixty pounds is required to cause rupture. In treatment, however, we apply only a pressure of about eight pounds." If there were any fear of rupture, it could probably be prevented by firmly pressing the tragus into the external meatus.

As compared with the Valsalvan method the application of medicated nasal-tipped inflators as I have fitted them to the compressed air apparatus makes an effective topical application of various medicaments possible without any active exertion on the part of the patient. In the Valsalvan experiment there is no medication of the middle ears, but simply a mechanical effect of moderate pressure, and a probable congestion resulting from the straining effort. A. Hartman has shown that four to eight pounds pressure by the Valsalvan method is required to bulge forward a healthy drum head. In numerous experiments the pressure averaged from twenty to twenty-six pounds in males, and from fourteen to twenty-two in females. But owing to swelling of the Eustachian tube or contained secretions this experiment often fails.

The unwisdom of advising patients to practice the Valsalvan experiment has often been demonstrated by individuals who have come under my observation with a history of rapid failure of hearing owing to their habit of carrying the aurist's instructions to excess.

Politzer's method is far preferable. He says: "The pressure for the application of my method in practice varies as a rule between fifteen and sixty pounds, which can easily be produced by a compression of a

pyriform India rubber bag capable of holding ten to twelve fluid ounces. Only in a few cases is it necessary to apply a greater force."

The six ounce bag is as large as can be conveniently compressed by the hand alone, and the compression of these very large balloons between the hand and knee or side of the surgeon does not seem to fulfil the ideal of an artistic performance.

A decided advantage to both patient and operator in the adaptation of the inflator to the compressed air apparatus lies in the fact that it renders it possible to treat most aural patients without the Eustachian catheter.

The sponges of the inflator may be saturated with solutions of camphor-menthol or other remedies in lavoline, and sprays of these medicines can be propelled through the nose and Eustachian tubes into the middle ears with ease and certainty in the majority of cases. This diminishes the danger of syphilitic infection and of irritation of the Eustachian orifices.

Often gentle pressure will accomplish this. Indeed patients sometimes feel a spray enter the ear from an ordinary hand atomizer, especially when the cheeks are distended. By turning on the current of air gently, and gradually increasing it, the permeability of the tube may be re-established by a weak air pressure more easily than by a sudden forcible current.

In practicing this method I have usually found the results most satisfactory when the patient assisted by inflating the cheeks and keeping the lips firmly closed. At the instant the nasal cavities become filled from the inflator the velum palati and base of the tongue press automatically upward and backward, completely closing the post-nasal space. I have now under treatment a case in which the soft palate is absent through ulceration, but the tongue so thoroughly shuts off the nasal cavities during this experiment that fifty pound's pressure is concentrated on the right middle ear while the left is closed. Nevertheless there are some instances in which the ears are more readily inflated during the act of swallowing.

It has been suggested that these forcible air currents might convey discharges into the mastoid cells, but Dr. Michael has "proved that, especially with the application of strong currents of air, the secretion in the tympani cavity is always propelled into the external meatus and not into the mastoid process."

Occasionally one sees a case in which the current of air from the nasal-tipped inflator fails to open the Eustachian tube. Probably the anterior lip of the orifice of the tube is pressed by the air more firmly than ever against its fellow, closing it like a valve. A case now under treatment resists ninety pounds with the nasal bulb, but fifty pounds pressure carries camphor-menthol and lavoline into his middle ears through the catheter.

Treatment by the catheter is accomplished with the same inflators I have already mentioned, the catheter tip being substituted for the nasal bulb. The sprays are thrown through the catheter in interrupted jets without imparting discomforting movements to the catheter, a feat well nigh impossible in the practice of Politzerization with the air bag fitted with the hard rubber tube which is inserted directly into the catheter, and without any intervening flexible tube, as the custom is in Vienna.

Proper precaution should be taken to prevent dust from entering the air reservoir, although, by the methods I practice all air entering the ears is filtered and medicated.

Finally, these methods make the middle ears nearly as accessible as the nose and throat for treatment with the various volatile remedies and sprays.

70 State Street.

Discussion.

Dr. Richardson stated that he did not wish to doubt Dr. Bishop in his statements made in his paper, but he could not see how it was possible to use a pressure of over forty pounds without causing injury to middle ear and rupture of membrane. He was only explainable from his standpoint by the possible loss of pressure in the passage of the column of air through tubes, sponge, nasal cavity and Eustachian tube until pressure was reduced to that usually obtained by the ordinary method of Politzerization. Four years ago, at the meeting of the American Medical Association, at Newport, he reported several cases of inflammation produced in the middle ear by the use of high pressure in atomization and it was the universal consensus of opinion that such condition often arose, under these circumstances, and instances were cited by several present. Even by the use of the low pressure obtainable by the use of the Politzer bag rupture of membranes did take place and two such cases had occurred in the doctor's practice. Of course these cases were not normal membrane, nor is Dr. Bishop treating normal membranes—a pathological membrane, atrophies here and adhesion there will not stand the pressure of normal membrane. For his part he could not see how the use of such high pressure could be borne by any nose. It seemed to him that it would cause serious lesion to nasal, pharyngeal and tympanic mucous membranes. The use of even low pressure is often attended with great pain, how much more so must be these pressures of 50 to 90 pounds.

Dr. Richards asked Dr. Bishop if the reporting such high pressure, under his authority, might be misunderstood by others, who resorting to these methods, not possessing his skill, cause rupture of membranes and serious lesions of nasal cavities and ears.

Dr. Seiss has only obtained five pounds' pressure from Politzer bag, and has seen rupture of the drum from this force. Regards 12 pounds as the maximum force to be employed in nasal sprays. Thinks a pressure of 50 pounds most dangerous and quite unjustifiable in treatment of Eustachian tubes or nasal mucous membrane.

Dr. De Vilbiss thought that great care must be taken in regulating the pressure. Perhaps Dr. B. had lost more force than he supposed in the transit of the air from reservoir to middle ear.

Dr. Price Brown, Toronto, had not been able to administer sprays of cooling solutions of a stronger air pressure than 12 pounds to the inch without producing hæmorrhage from the nasal mucous membrane. With sprays of albolene and glycolin as a menstruum 15 pounds pressure to the inch could be used and without hæmorrhage, but not a higher pressure.

Dr. Randall said the question was not what pressure was used *at* but *in* the ear. The manometer connected with the external canal was the sole means of determining the pressure actually employed. High pressure air in small volume might penetrate the Eustachian isthmus, but would instantly be reduced by expansion in the tympanic and mastoid cavities. On the outer surface of the drumhead the diver at a depth of 15 feet finds a pressure of 7 to 8 pounds painful, and 10 to 12 pounds hardly bearable. Yet the movement outward of the membrane would be greater and a higher pressure tolerated or relieved by distension.

Dr. Thomas Hubbard, Toledo :—Having conducted some experiments in this line, and having arrived at conclusions that seem to be at such contrast with those of Dr. Bishop, it becomes a duty for me to speak on this subject, since I believe that his statements are positively dangerous, and contrary to actual facts and conditions. For instance: he states that he considers a pressure of 15 pounds safe for inflation of middle ear of an infant. In my experience a pressure of one pound is too great for a child of some years. His range of pressure for the adult is 50 to 90 pounds. This I would divide by ten and yet divide it again by two. My range of pressure is between one and two and one-half pounds for the adult. I am referring to the air pressure gauge in connection with the tube conveying the air to the nostril, and of course mean pounds per square inch.

I would therefore challenge every estimate that he has used in the above statement, and would respectfully refer

the doctor to certain facts in the physiology of respiration for proof in part. A strong robust adult can by forced expiratory effort raise the air-pressure in an accurate air-gauge from 3 to 3½ pounds. Therefore, by the Valsalva method we are right in inferring that this is about the maximum pressure obtainable.

Very few persons can tolerate all the pressure that they can bring to bear in this process of self-inflation without pain or rupture of the membrane. Here then, is an indication of the maximum pressure that can be safely used, namely, 3or 3½ pounds.

The basis of the Politzer method is the fact that the Eustachian orifices are made patulous by the very act of swallowing. The doctor ignores this and consequently must employ much higher pressure than is necessary, although I cannot believe that he gets one-tenth of the pressure that he would lead us to believe.

Dr. Bishop in closing the discussion said: The gentlemen who have participated in this discussion have emphasized the point upon which I have laid special stress, that is the danger in using air from reserwoirs under very high pressure without being able to determine the amount of pressure and the volume of air used. In other words, the dosage. It takes these two elements to make up the dose-pressure and volume. That is my apology for calling your attention to this very simple little device pictured in the cuts that are distributed among you. Dr. Hubbard thinks I use a dangerous pressure when I speak of 75 or more pounds. It would be dangerous in the absence of any means of controlling the amount of air used.

Does it make any difference, gentlemen, whether you use a cubic foot of air under high pressure or a cubic inch? Does it make any difference whether you throw a pebble or a rock at a pane of glass? Shall we make no distinction between a high pressure column 1-16 of an inch in diameter and one large enough to constitute a cyclone?

Without this air meter to put both pressure and volume under our entire control I would not advocate the use of high pressure. But with it one can use air from my reservoir which is filled every day with air under 100 pounds pressure to the square inch with as much safety as lies in the low pressure receivers mentioned by Dr. De Vilbiss.

Granting this, which I am prepared to demonstrate, you must concede that the possibilities of breaking up adhesions and anchylosis and overcoming immobility of the ossicles and restoring the sunken drum membrane to its normal position, are greatly increased.

Since it requires 4 to 8 pounds to bulge forward a healthy drum head, many times the pressure is necessary to affect these old thickened, leather-like membranes that have been held retracted by anchylosed ossicles for years. I have often removed such membranes and have found them thick, tough and sometimes gritty from chalky deposits. What effect can you expect to produce on such ears by one pound of pressure on the inner side of the drum head while there is constantly an opposing atmospheric pressure of fifteen pounds to the square inch on the outer side of the drum?

The gentleman at my right speaks of having had inflammation and even rupture of the membrana tympani from the use of Politzer's method. I have had no such experience, but I do not make use of strong inflations in children or in the acute stage of inflammation.

One of the two principal conditions upon which I predicate the safe use of high pressure seems to have been forgotten in the discussion. That is the ability to control the amount or volume of air used at each dose. While I use only the minutest column of air under high pressure, I am able to cut off a dose of this column, or subdivide it, so as to limit it to a fraction of a cubic inch. You can open the valves 1-32 or 1-64 of an inch if you like.

This air meter may be compared to the milliampére meter which makes it possible to obtain therapeutic effects from electricity which would be otherwise impossible or dangerous, because the dosage can be determined and definitely controlled.

MUCHOLD reports a case of Grave's disease in which he removed the posterior half of one of the inferior turbinate bones with the galvano-cautery, with immediate improvement in all the symptoms except the goitre, which was, however, readily reduced by a mild galvanic current. He suggests the possibility of the disease being sometimes due to some reflex disturbance.

SOME OBSERVATIONS UPON EXCISION OF THE MEMBRANA TYMPANI, AND THE TWO LARGEST AUDITORY OSSICLES.

Read before the Section of Laryngology and Otology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

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A year ago I read in this Section a paper upon excision of the membrana tympani and the two largest auditory ossicles, in which two sets of indications for the operation were set forth as follows:

1. The deafness, tinnitus and vertigo of chronic catarrhal otitis media, especially when adhesions exist between the membrana tympani and the promontory in the inner tympanic wall, or when there is evidence of synechiæ between the ossicles.

2. This operation is indicated in the suppuration, deafness, tinnitus, vertigo, headache, and recurring earache of otitis media purulenta chronica.

Conclusions regarding the results of the operation in cases of chronic catarrhal otitis media were presented as follows:

1. The operation of excision is attended with no bad results, even if it do no good, and its effects are superior to massage, mobilization, plicotomy, etc., etc., applied to the membrana and the ossicles.

2. The most constant result of the operation is a relief from a sensation of pressure and fulness in the ear.

3. There is generally a more or less prompt, entire and permanent relief of tinnitus and aural vertigo (so-called Ménière's symptoms).

4. The least frequent and permanent result is improvement in hearing. Sometimes, however, this is marked. In some instances the improvement in hearing is maintained after regeneration of the membrana tympani. In those cases of chronic catarrh of the middle ear, in which everything else has been tried without benefit, it would seem rational that the patient should have the chance of improvement offered by this harmless operation, for harmless it certainly has been in all my cases, even if the benefit has been slight or *nil*.[1]

Conclusions regarding the results of the operation of the excision of the membrana tympani and the two largest ossicles, in chronic purulent otitis media.

1. The operation has not failed either to greatly diminish or check the suppuration in all the cases of chronic otorrhœa in which the writer has applied it.

2. In attic cases with normal atrium, the sole perforation being in the membrana flaccida, this operation has shown itself to be the *only* sure means of cure. I would add that in attic cases, with diseased atrium and with perforations, both in the membrana flaccida and membrana tensa, this operation has also effected a radical cure after the disease had defied all other remedies.

3. By this operation in chronic purulent otitis media, especially in cases in which the perforation in the membrana tensa is comparatively small and while the disease is limited to the drum cavity, the

[1] Since writing this paper, I have been forced to conclude that in many cases of chronic catarrhal otitis media better results can be obtained by the removal of the stapes, as well as the incus. In some of such cases it may be well to let the membrana and malleus remain.

suppuration can be directly reached and treated and drainage improved by the removal of the membrana tympani and malleus, before the purulent disease has attacked the posterior portion of the drum-cavity and the antrum. Thus mastoid inflammation, and necrosis, sinus-thrombosis, pyæmia and cerebral abscess are prevented.

4. If any hearing exists before the operation in purulent cases it invariably improves after the excision of the necrotic membrana and ossicles. Vertigo, headache, tinnitus and the attacks of ear-ache from gatherings, so common in chronic otorrhœa, are entirely and permanently removed. The general health which is nearly always impaired in these cases by a form of mild chronic septicæmia from the chronic purulency in the ear, is always improved by the antiseptic effects of the operation which removes the septic nidus and makes it possible to render the drum cavity entirely aseptic by the improved drainage and direct medication.

I have seen no reason for changing any of these conclusions; on the contrary I am more firmly convinced of the great benefit especially in chronic purulent cases, to be derived from the operation of excision of the necrotic membrana and the diseased malleus and incus. The latter bonelet, however, is readily destroyed by purulency in the drum-cavity and hence, in chronic cases, is rarely found when the operation is performed.

Instruments.—Straight instruments have been found preferable to those set at an angle with the handle. As the operation is one largely performed by fingers the straight instrument is more easily managed by the slightest movement between the fingers. The tactile impressions conveyed through the easily-moved straight instruments are much more definite and useful than those conveyed through the awkward and angular instrument-handles, which have to be managed by hand and wrist to some extent and hence cannot be so delicately manipulated. The incus-knife of the writer, consisting of a short blade set at right angle to the shaft, can be used as both knife and hook with which to pull out the incus after it has been detached, even when it has slipped back out of sight towards the mastoid cavity.

The recumbent position favors the slipping backward of the incus after it is detached from the stapes, and especially if it be already detached from the malleus. Therefore it is much more convenient for the operator to lift the head and shoulders of the patient up as high as the anæsthetic state will permit. This can be done very easily by having the head- and shoulder-portion of the operating table hinged so as to lift it to any angle desired.

I would merely mention here that I have always employed ether in my operations, the illumination of the ear being effected by a six-volt electric head-lamp supported on the forehead.

Teeth.—The teeth should be in good condition before the operation, especially when performed for the relief of the symptoms in a case of chronic aural catarrh. In a case of this kind operated upon last November (1891), and in which iodoform blown into the ear immediately after the operation, and renewed several times soon afterwards, seemed to prevent regeneration and in which the improved hearing and diminution in the tinnitus were maintained, a diseased and painful tooth, apparently caused irritation in the operated ear.

The patient sought the aid of a dentist for relief of toothache in January, two months after the operation. The tooth was extracted roughly, as it appeared to me. Pain in the jaw and throat ensued with ear-ache and suppuration in the ear in which the excision had been performed. During the mucopurulent discharge which ensued, and which was followed at last by regeneration of the membrana, the patient, a woman of thirty-three, showed symptoms of secondary syphilis evidently contracted from her husband. The regeneration of the membrana tympani was not followed, however, by diminution of hearing, nor increase in the tinnitus, which had been measurably diminished by the operation. Though, in this case, the acute inflammation in the ear operated on, may have been induced by the secondary syphilis, bad teeth are competent to act prejudicially in any case of excision of the membrana tympani, and hence, they should be examined and put in good order, before the operation.

Operation on both ears.—In two cases of chronic catarrhal otitis media, one in December, and the other in January last, I excised the membrana tympani and malleus in both ears. In the first case, a woman forty-five years old, operated upon in the Presbyterian Hospital, there was no relief. Regeneration was prevented in both ears by insufflations of iodoform, retained for weeks. In the worse ear there was some reaction upon leaving the hospital and taking cold in January. This was promptly checked by iodoform insufflations and total regeneration prevented. A new membrana formed excepting a small central hole. In the better ear no regeneration has yet occurred, six months after the operation.

In the second case, a woman sixty-five years old, operated upon in the Presbyterian hospital, in January last, both membranæ and mallei were excised without relief. The woman was the subject of great cranial neuralgia and debility from hard work. The operation afforded no relief. Regeneration was prevented in this case by the use of iodoform insufflations. In March of this year, three months after the operation on the ears, the patient left the hospital, without regeneration of the membranæ. She went to work, took cold, and early in May suddenly developed in the worse ear an acute otitis media, with pain and copious discharge. The case has been readmitted to the Presbyterian hospital and is now under observation. Regeneration, at least partial, will ensue. Inflammation occurring in these cases in the worse ear, though months after the operation, would seem to indicate that 1, in all chronic aural catarrh there is an inclination to acute suppurative processes in proportion to the degree of sclerosis, or trophic change; and 2, that this tendency is always likely to be a menace to success of the operation in chronic catarrhal otitis media; 3. The only hope of combating this tendency, so far as my experience extends, lies in the immediate application and prolonged retention of iodoform in the seat of the operation.

In two cases of chronic catarrh of the middle ear, I have recently removed the *malleus and incus* for the relief of deafness and tinnitus. In the first case, a woman thirty-two years old, I removed May 9, 1892, the malleus and incus, and insufflated iodoform, the hearing was improved by the second day for clicking sounds and for the voice. A clicking sound could

be heard twenty feet away from the ear operated on, while it was audible about half the distance in the other ear. The voice was heard a foot away in the ear operated upon, and the impact of sound was novel and somewhat disagreeable on this side. Before the operation it was a question whether isolated words were heard in this ear. The tinnitus was not materially lessened. Notwithstanding a severe reaction in the ear on the fifth day after the operation, the improvement in hearing was maintained.

In the second case, a woman twenty-four years old had complained of tinnitus and deafness in both ears, for eighteen months. In the left ear there was considerable ankylosis and tinnitus. The hearing was eighteen inches to two feet for isolated words. Some hypertrophic nasal catarrh. Tinnitus quelled for five minutes in the left ear by using the pneumatic speculum. May 13, 1892, excised the membrana, malleus and incus, and insufflated iodoform. Tinnitus was not entirely quelled by operation. No improvement in hearing the first two days. By the third day tinnitus less and hearing improved. In a week the hearing was eight and ten feet for isolated words. On the ninth day after the operation patient went to church and was able to hear better than she has for over a year. No reaction in this case by the twelfth day, the iodoform was dry in the fundus of the ear and the patient went home to another city well satisfied with the result of the operation.

The improvement in hearing when it occurs as the result of the operation in cases of chronic sclerotic otitis media, is always *progressive*. It would seem from this that the direct transmission of sound to the stapes effected by the removal of the membrana tympani, mobilizes the ossicle in an effectual manner. The passive motion thus conveyed to the stapes gradually overcomes the ankylosis which has been hindering its movements, rendering it consequently more vibratile and responsive to sound-waves. The nerve of hearing too, by the renewed reception of sound impressions thus once more conveyed to it, probably becomes more sensitive to ærial sound waves, its normal stimulus.

Results in chronic purulent otitis media.—In cases of purulent otitis media the results of the operation of excision of the membrana and the malleus are usually eminently satisfactory as shown by the history of the following case: Thomas B., aged 12 years, an intelligent lad, has suffered from chronic otorrhœa and deafness of the left ear for some years. No account of the inception of the disease could be obtained. Examination revealed a uniformly swollen, red, flat and dry membrana tympani, with a large and narrow oval perforation in the anterior inferior quadrant of the membrana very near the periphery. No signs of the malleus could be seen in the flat, even surface of the swollen membrane. Through the perforation a little muco-pus could be seen, and when this was mopped away with cotton on the holder, the granulating inner wall of the tympanic cavity could be seen and made to bleed by a touch from the probe. Hearing for isolated words in the diseased ear was two feet. At times the discharge was copious enough to appear at the meatus.

On April 12, 1892, the lad was etherized and the greatly thickened and diseased membrana with the malleus excised. No trace of the incus could be seen, or felt with probe. The membrana was greatly thickened and tough, and its inner surface was studded with granulations. The inner tympanic wall was also granular; but the hæmorrhage during the operation was comparatively slight for a purulent case, in which as a rule, the hæmorrhage is considerable for so small a field of operation. Iodoform was insufflated and the ear let alone for a day or two, when it was mopped clean with hydrogen dinoxide and more iodoform insufflated.

On April 28, a test of the hearing revealed an ability to hear isolated words eight feet from the ear operated on. There was no discharge. On May 16, another test revealed a hearing distance of twenty feet for isolated words. The inner wall of the tympanic cavity had lost its granulations and had become gray and smooth and there was no discharge. The patient was dismissed from the Presbyterian hospital where he had been operated upon, and resumed his duties in school.

THE OPERATION FOR EXCISION OF THE OSSICULA IN CHRONIC AURAL CATARRH WITH INSTANCE OF A FAILURE.

Read before the Section of Laryngology and Otology, at the forty-third annual meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

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Before taking up the subject matter of my paper I would like it to be distinctly understood that I intend casting no aspersions upon aural operative procedures. My standing upon this subject may perhaps be known.[19] I refer more particularly to excision of the ossicles in chronic suppuration and in chronic aural catarrh. I have had marked success both previous to and since the one disastrous result which forms the nucleus of this paper.

Sexton,[14] Burnett,[4 5 6] Colles[7] and others in this country do not mention any bad results, from the operation occurring in their practice. The latest article[9] that I have seen relating to operative interference in chronic aural catarrh says: "With reference to surgical procedure I can truly say that in no case have I seen a bad result follow any of the operations, either immediately or subsequently, and in nearly all cases there has been a certain amount of improvement either in diminishing the tinnitus or in improving the hearing". Most papers go on in this strain and say that while we can never promise in a given case what the amount of improvement will be, we can promise that the condition will not be aggravated and that the chances for improvement are certainly favorable.[9] This was and is still, my opinion for cases that I accept for operation.

In all the literature of the subject at my command, I can discover but little mention of accidents occurring during or after the operation, and these have all been in suppurative cases. I can find, in only three instances, the admissions of but two operators, of unfavorable results upon the hearing. In 1889 Wetzel[18] reported two cases in which the hearing had been made worse, in the one where the mastoid antrum had been opened during the excision and in the other where the stapes had been interfered with. Yet the latter has occurred in other instances without ill effects and the bonelet has been bodily removed experimentally in animals whose hearing was still preserved.[3]

Reinhard,[11] of Duisborg, in a paper upon Hammer-Amboss-Excision, admits that in only one case in his practice, which however "could not be controlled," was there any malefic effect upon the hearing. In the discussion upon this paper, Schwartze[12] said that neither he nor his associates had, or had heard of a death following the operation and that he had seen no ill effects beyond paralysis of the facialis and vertigo. He claims that the former is the fault of the operator, being produced by injury to the Fallopian canal from the incus hook. This need not happen in operating for proliferous disease as removal of the incus is unnecessary.[15 17] In one case Schwartze[12] had seen vertigo, persisting for over a month, following the operation. I have noticed temporary disturbance of the sense limited to the tongue tip of same side[19] and in a case operated on two months from date of writing, although some relief was experienced from the tinnitus and deafness, there is yet complete absence of this sense in the end of the tongue on operated side. After operation for non-purulent disease suppuration is a common event as shown by reports of others.[5 14] In the year previous to the date of case reported in this paper I had excised the ossicula in six cases[19] and since that time in five more. Four of these have been for non-suppurative inflammation. In only one instance has suppuration followed. I may add that my cases are carefully chosen according to the rules laid down by Burnett[4] and by Sexton.[14]

One year ago a strong healthy man of sixty consulted me about his ears. He complained of deafness, noises in the head and vertigo for which he sought relief. He claimed that the right ear had discharged, many years ago, and since had been totally deaf on that side. For about five years the left ear had been failing until now conversation was carried on with difficulty. Status præsens:—R.E., H.D., loud sounds. Tuning fork of low pitch by aerial conduction. Bone conduction better than on other side. Drum-head retracted with chalk in membrana flaccida. L.E., H.D. Watch p-150, whisper 2 cm., voice 1 ½m. Drum-head retracted and opaque; malleus not freely movable. Eustachian tubes on both sides patulous. Has hypertrophic rhinitis and deviated septum.

I treated the nasal hypertrophy after Bosworth's[2] method and made local applications to the naso-pharynx with marked benefit. Treated the middle ear of both sides by catheter, using camphor iodin and camphor-menthol vapors for three weeks, and followed by the injection of sodium bicarbonate solution for over a week with absolutely no improvement of hearing on either side.

The tinnitus was still about the same, and despairing of improvement by other than surgical means, I suggested an operation. In July following I removed the membrana tympani and malleus under ether anæsthesia. The operation was clean and although several attempts were made to reach the incus it was not obtained. These were made by the incus hook and no reckless gouging was done. Although the anæsthetic was given by a skilled assistant the patient did not take it well, he became cyanotic at times and the progress of the operation had to be delayed. There was excessive vomiting after recovery. When he came to his senses he complained greatly of vertigo. This was ascribed to the after effects of the ether. On testing his hearing on the evening of the second day I found him so deaf as to only understand shouted words, and upon investigating the cause I was surprised to find that he was *totally deaf on the operated side*. No other reaction followed, until five days later, he had pain at night, and on the next morning an acute otitis media set in which ran its course in two weeks. For four weeks after there was an occasional mucous discharge, the tympanum being dry for days together. All this time the operated ear continued stone deaf. The after treatment for the first few days consisted in "letting bad enough alone," and after the acute attack of inflammation set in, was gentle wiping out of the canal by cotton wet with 3 per cent. boric acid solution. After several days of this a little powdered acid was blown in the ear after cleansing. Internally I gave him drop doses of tincture aconite and later pilocarpin, with no appreciable effect from the latter on the hearing. A couple of months later, when the ear seemed quiet, I commenced the use of galvanism with the result of setting up sufficient irritation in the operated ear to cause an acute discharge. This was tried several times and further treatment of that side given up as a hopeless case. During this period I had been treating the other ear by active and prolonged massage, applied both directly to the malleus by a cotton-tipped probe and by Siegel's otoscope. Also continued inflation by the catheter, etc. To our gratification this ear rapidly improved in hearing until after one month's treatment he could hear the voice at 1½ m.

About this time I sent the patient in consultation to Bishop, of Chicago, who treated him for a couple of weeks, with the idea of helping the hearing on the operated side. Dr. Bishop had better luck than I with electrical treatment, and wrote[1] me that the patient could, at the time of writing, hear the upper notes of the scale. This I observed on his return. The patient was obliged to visit New York, and while there, on the advice of Dr. Bishop, consulted an aurist by whom I understand little encouragement was given. He was placed upon specific treatment later, with no results as regards the deaf ear, which since that time has remained in about the same condition. The noises in the head ceased entirely a few days after the operation and have never returned. The loss of these, however, does not make amends for the loss of hearing. Since that time I have succeeded in bringing up his hearing distance on the non-operated side to voice at two meters.

In regard to the probable lesion after the operation I would suggest a hæmorrhage in the labyrinth happening during the anæsthesia or during the excessive vomiting thereafter, with subsequent organization of the blood clot. In respect to the advisability of the operation in this particular case, I would state that hereafter I shall not operate upon patients of his age. In a private communication from Colles,[8] of New York, over this case, he raised this objection and wrote that he did not think that the labyrinth was primarily involved and thought that improvement could be expected after cessation of the suppuration. Subsequent observation has not upheld this opinion. Dr. Colles considered sclerosis an unfavorable symptom. Stacke,[16] of Erfurth, also holds this view. On the other hand Sexton,[14] Burnett[6] and Schwartze[12] consider that the advance of progressive sclerosis may be effectually stopped by the procedure. My experience tends to substantiate the latter statement. Randall[10] and Seiss[13] do not consider the operation advisable in chronic aural catarrh.

One lesson from this case is that our prognosis as to the results of excision of the drum-head and malleus must be guarded and the patient must not have rose colored anticipations of the probable amount of benefit to be derived from the operation.

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[14] Sexton, Samuel, "Operation for the Relief of Deafness, Noises in the Head and Ears, and Vertigo due to Chronic Catarrh of the Drum of the Ear," Archives of Otol., April, 1891.

[15] Sexton, Samuel, Discussion in Section of Otol. and Laryngol., 42d Meeting Amer. Med. Assoc.

[16] Stacke, "Indications for Excision of Hammer and Anvil," Archiv. für Ohrenheilkunde, xxi, 201.

[17] Turnbull, Laurence, "Progress of Otol.," Annals Ophth. and Otol., April, 1892.

[18] Wetzel, "Die Excision d. Trommelfells u. d. beiden ausseren Gehorknochelchen," Halle, 1889.

[19] Würdemann, H. V., "The Treatment of Chronic Suppuration in the Middle Ear by removal of Carious Ossicles, Necrosed Bone and other Obstructions in the Tympanum," Med. Progress, July, 1891.

Discussion.

Dr. Randall said that the excision was done for two conditions so unrelated, that the suppurative and non-suppurative cases should be decidedly separated in discussion. His experiences in catarrhal cases had not been satisfactory—one of his cases, with no gain in hearing, having gone on to severe suppuration with mastoid empyema, burrowing to the neck and occiput, and life was saved by a hair's breadth. Gelle's test for stapes ankylosis often seemed the criterion in deciding between excision and stapes mobilization. In suppurative cases he was slow to operate, since most of the forty instances of attic disease with Shrapnell perforation, often with superficial cases seen in the last year, as in previous experiences, had improved so rapidly as to admit no question of operation. Done only in the most urgent and severe cases, the excision of the carious ossicles had proved disappointing. No instance of harm had occurred; nor a single brilliant result; the drainage had often not been specially improved as evidenced by the formation of new sinuses. In every case in which he had excised for caries, he regretted that he not done the more radical operation of Stacke, removing, as Walb puts it, the *bony* as well as the membranous outer wall of the tympanum. Thus only can the attic-caries be freely exposed to operative or other treatment. As to the operation in both forms of cases, the German experience was certainly much longer and larger than any on this side of the Atlantic, since Voltolini, Lucae, Hessler and Schwartze had each, probably, double the number of operations of Sexton or any other American.

Macluen Smith, Philadelphia:—Age has not in my hands had any influence in the result of the operation, and yet we must certainly expect better results from the more recent cases.

The youngest case was a child six years of age suppurative in character. The eldest was a gentleman of seventy-two years (non-suppurative) with distressing "menieres symptoms" for twenty-six years. This case was not for sixteen years, able to leave his chair or bed without the assistance of an attendant. This case was operated on left ear three years since, which markedly reduced his symptoms; the right ear was operated on one year ago since which time the patient is entirely relieved of vertigo and tinnitus, with sufficient restoration of hearing to enable him to appreciate most ordinary conversation, with continued improvement of hearing. We must, of course, look for and expect better results from the suppurative cases and I would consider it the surgeon's duty to give his patient the benefit of such surgical procedure, and thus reduce to a minimum the danger of mastoid and cerebral complications by allowing such pathological conditions to continue.

Dr. Richardson stated as this appeared to be an experience meeting he thought it wise for each to give his personal results. He had operated several times in these cases, but most of his work, like that of others present, had been for chronic suppurative cases, rather than the chronic catarrhal. In all he had done ten operations, eight for suppurative and two for non-suppurative catarrh. His six cases have already been reported, the other four are of too recent date to give results. An analysis of cases followed. In concluding he stated that he thought in many cases of disease of the attic, with involvement of the osseous wall and probable implication of the mastoid antrum he would prefer Stacke's operation to the present operation.

Dr. Seiss has not operated in catarrhal cases, and would not at present feel justified in doing so. In suppurative cases regard the operation as a distinct addition to aural surgery. Depends mainly upon mobilization of the ossicles to relieve hopeless sclerotic deafness—a long incision being made posterior to the malleus and traction made on the incudo-stapedial joint. Otherwise, incurable tinnitus may be almost invariably relieved by the speaker's method of freezing the mastoid. Ether, ethyolene, or chloride of ethyl may be used. are free from injurious results, and are most satisfactory in many cases, acting as a cure in a few cases

Dr. Seth S. Bishop, of Chicago, said:—I have never hesitated to remove the drum head and ossicles when it was necessary to cure suppurative inflammation. But in the class of cases mentioned by Drs. Burnett and Würdemann, my opinion as to our duty is not so clearly defined. I have been loth to operate for several reasons.

In order to collect statistical information on the subject, a year or two ago, through the medium of the medical journals, I invited all American aurists who had performed this operation to communicate to me the outcome of their experience. Such a small number responded, and the results given were so unsatisfactory, that I was forced to the conclusion that either very few had operated, or the results were not of a nature to encourage the operators to report them.

I have opened the drum several hundred times. A number of years ago I reported the results of 30 cases I had operated upon. I had removed either the whole of the drum head or parts of it for the relief of tinnitis aurium and chronic progressive deafness attributable to non-suppurative inflammation. Many cases are benefited to a very satisfactory degree. I met one of those referred to a few days since, an operator on the board of trade, who says now that the operation was a benefit to him.

In another case in which I removed both drum heads, one remained well open, after a partial regeneration of the membrane, for a year and a half with satisfactory results as long as the patient remained under observation. After removing the other drum head there was a slight muco-purulent discharge. While this continued the hearing was much improved. After this discharge ceased the hearing distance diminished. The patient insisted that if the middle ear was kept moist he would hear better. I filled the ear with simple vaseline, and at the expiration of a week the drum head was found reproduced. Other cases were only slightly benefited, and some not at all.

Now it is a reasonable inference that if this opening of the drum head benefits a patient, a complete and permanent removal of it will make the improvement permanent. If the mallet is not removed the drum head will probably be reproduced, and it may be even after the ossicles are extractep. I would suggest the minor operation of removing a section of the membrane as a preliminary test. If this is followed by considerable improvement, then I would resort to the more radical operation. This much can be said in favor of the test operation: the removal of a section of the drum head is not followed by any disastrous consequences.

These observations are all based upon the supposition that the labyrinth is not involved in the disease. Should there be sclerosis, atrophy or paralysis of the auditory nerve, of course an operation to improve hearing is out of the question. But if the only trouble is that sound waves cannot reach the round window and foot plate of the stirrup because of the barrier interposed by the immovable ossicles and membrane, then an operation is a logical and promising procedure.

The case of failure reported by honest Dr. Würdemann, and for which report we owe him our acknowledgements, I have seen several times through his courtesy. A few weeks ago as this case was passing through Chicago, I made an examination and found that the right ear which had been nearly useless to him for many years, had been improving until he could hear loud conversation without the conversation tube. This ear had been treated but not operated upon. The operated ear remained useless for conversation, but he could hear me whistle all the tones except two of the scale from middle C upward one octave, through the tube. He could also repeat after me nearly all of the vowel sounds. The discharge had nearly ceased.

I may add, however, that nearly a duplicate of this case has recently come under my observation. Before the operation the patient said he heard his watch 2½ inches. A New York aurist removed the drum head, mallet and part of the anvil. The tinnitis was not relieved. He is totally deaf and has a purulent discharge from the ear.

Such cases are discouraging. In my opinion we should perform this operation only in such cases as I have described, after a preliminary test opening of the drum head, and giving the patient the benefit of any reasonable doubt.

Dr. Burnett said:—An accident following incision of the membrana and the auditory ossicula, was largely, if not entirely due to rough manipulation. Disturbances in taste after the operation is evanescent. When it has been disturbed in chronic suppuration before the operation, the sense of taste has improved after the operation.

Gelle's test for ankylosis of the stapes is not necessary in

chronic catarrh if any hearing is present, as hearing would prove that the stapes is not entirely ankylosed. Even if ankylosis of stapes were to exist, this should not prohibit the operation of excision in aural vertigo and severe tinnitus. Stacke's operation, or Arbuthnot Lane's operation is a mastoid operation and not to be compared with excision of the membrana and ossicles in attic suppuration. If excision is performed promptly in attic suppuration there would be much less need for mastoid operations.

Dr. Würdemann, of Milwaukee, in closing the discussion:—Young men, as a rule, are apt to take up these new operations which are so highly advocated. I presume that I am no exception to the rule, but in regard to these chronic suppurative cases with necrosis of the ossicles coming to me (generally they are "rounders") I am disposed, after cleansing and antiseptic treatment has been tried, to urge an operation. Gentlemen, I get tired of treating these cases after a few weeks. In chronic aural catarrh I believe we should be conservative and choose our cases. My experience in non-suppurative disease is limited to four cases. In one total deafness followed the operation, as reported in this paper. In the second, a negative result; in the third, the tinnitus and deafness were markedly relieved, and in the fourth the results are not yet fully developed. In this last case I have been obliged to do two secondary operations on account of regeneration of the drum-head again diminishing the hearing.

SPASTIC CONTRACTION OF TENSOR TYMPANI MUSCLE.

Read in the Section of Laryngology and Otology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

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The purpose of this paper is to present, in as concise a manner as possible, a case of objective noise in the head. Objective noises in the ears are of uncommon occurrence, as only a small number of cases have been reported. The sound usually produced is said to resemble the snapping of the finger nails, or the sudden drawing apart of the finger ends when slightly moistened with saliva or a tenacious fluid (Burnett).

The case which I present was under observation many months, during which time it was the subject of considerable study, and of curiosity, to many of my colleagues.

Belton Adair, a young half-breed Chinese boy, 16 years of age, was referred to me by Dr. H. A. Robbins. His parentage is interesting. The father was one of the first Chinamen ever brought to the Atlantic Coast. He came over with Admiral Perry, and was said to have been quite a botanist. Settling in the South, he made the acquaintance of a poorly educated German woman whom he afterwards married, and who became the mother of three of his children, the subject of the present paper being the eldest. The father died young and his medical history is unknown. The mother is excessively deaf, communication with her being almost impossible. The boy is said to have possessed the usual physical development and activity of the average American youth of his age, until about his fourteenth year. Mentally he was said to be very precocious. He passed through the ordinary diseases of childhood, from which he made good and complete recoveries. At this period it was noticed that he had a peculiarity in walking, a slight uncertainty, but as this was considered to be a racial peculiarity not much attention was given it. During the spring of his fourteenth year the aural trouble, which makes him the subject of the present paper, developed. His guardian attributes his affliction to the habit the American children had of stuffing his ears with snow. The first phenomenon noticed was an intermitting roar which, after several months' duration, was followed by the "ticking," which continued without abatement until he fell under my observation. This noise was not only subjective, but was distinctly audible to one when coming in close contact with the patient's head. His guardian told me that her attention was first attracted to this unusual noise on a certain Sunday while at prayers in church, when the boy's head was resting against her own. During the prayers she heard the ticking, and supposing it to be a watch which the boy must have secreted, she demanded of him where he had obtained it, when he replied that it was that awful noise in his head. The ticking existed in both ears, but was always more persistent, continuous and irregular in the right than in the left ear. It was never absent in both ears simultaneously. It would frequently subside in one or the other ear for a few moments, hours or days; but never in both ears at the same interval. There was a want in rhythm in the same ear at all times, and absolutely none between the two ears. The right ear was far more regular in its click, if I might so call it, and I have noticed frequently that at different visits and at different intervals on the same day it would register the same number of beats to the minute. The left ear was markedly irregular—it might register one beat in one minute, thirty at the next, five during the third minute, and during the fourth remain absolutely quiet. Applying an otoscope to each ear of the patient connected with each ear of the observer, the following points were observed: The clicking in each ear was entirely independent of the other, they seldom or never pulsated synchronously, the clicking in the right ear was always more rapid and therefore more to the minute than that in the left ear, and lastly, it was noticed that they were not synchronous with the heart's action. The sound heard through the otoscope was the characteristic muscular click which attends the contraction of all muscles when in motion. This sound can be heard by the application of a stethoscope to any muscle while it is brought into active contraction, well heard over the masseter. I never heard the sound unaided by the otoscope. I never brought my head in close enough contact with that of the patient. Perhaps I was a little more scrupulous than scientific. I have no reason to doubt the observations of others on this point, as the first motion the poor sufferer made on being brought to me was the bending of his head forward in order that I might hear the sound within his head. At the time he fell under my observation, July, 1888, in his sixteenth year, he was evidently a great sufferer. The sounds in his head had existed for nearly two years without interruption. He was deprived of sleep and was almost unable to carry on a continued train of thought, on account of the distraction due to the incessant ticking. Lately, his guardian tells me, he had given up his books, as he found it impossible to study. For several years past he would frequently be noticed striking his head with his closed fists or against surrounding objects, so as to cause a cessation of the noise. Since this affection of his auditory apparatus he had lost a great deal of his brightness, mental vigor and clearness of intellect. His physical condition was not as satisfactory as it had been six years ago. He was of the average height, with a Mongolian cast of features, body well nourished, limbs very thin. In walking there was a marked unsteadiness of gait, a want of coördination, and a tendency to fall "all in a heap" in coming in contact with even slight obstacles. There was a certain amount of "lallying" in speaking and his ideas were very crude, causing one to doubt of his ever having showed any particular brilliancy of intellect. Memory was said to be fairly good.

Examination of Ears.—In this description, as both ears presented practically the same changes, it will not be necessary to designate right and left.

Auditory canal large, roomy and nearly straight, so that membrane could be readily viewed without aid of speculum.

Membranes normal in color, but dull; no opacities, cicatrices, atrophic spots or deposits. No light reflex, marked contraction, so that manubrium was directed almost vertically inwards, the umbo resting upon promontory. Short process very prominent. Siegle's otoscope demonstrated normal mobility of anterior and posterior segments of membrane; the manubrium remaining motionless. Careful ocular inspection, made many times and for prolonged periods, while sound was very distressing to patient, failed even to reveal the slightest movement in the m. t. or parts thereof. Eustachian tubes slightly contracted. On inflation air entered cavities freely, but with slight increase in pitch of sound. During inflation the anterior and posterior segments of membrane would bulge out, though manubrium would seem to be motionless. If manubrium showed any movement it was so slight as hardly to be noticed. The membrane would almost immediately assume its usual position after inflation, the injection along manubrium and upper pole being the only evidence of an inflation having been made.

The patient was to a certain degree unreliable in the testing of the hearing, but from frequent examination and

under varying surroundings, I concluded that hearing was practically normal for the acumeter, loud and whispered voice. Bone conduction normal.

Nasal and pharyngeal cavities were normal. There was no catarrhal inflammation of these cavities, nor was there any evidence of there ever having been any. Supposing that these muscular sounds might possibly be due to movements of the palati or constrictor muscles, I made frequent and prolonged examination of the oral and nasal pharynx without ever having observed the slightest quiver or twitch in these muscles; although through the intervention of the otoscope there was an incessant tapping going on in patient's ear. He became so skilled in rhinoscopic examination that he would allow the mirror to remain within the pharynx for many minutes without contracting soft palate or showing other evidence of tiring. It was also observed that neither of the processes of deglutition or phonation had the slightest influence on the frequency or rhythm of the muscular click. It was interesting to observe the influence exerted over the ticking,by the use of inflation through the medium of the catheter. The catheter being introduced,connection having been made with the patient's ear through the medium of the otoscope, the ticking progressing as usual, several inflations were then made, when it was noted that there was a momentary cessation of the clicking, followed by several short, sharp clicks and then a pause. This pause was only for a few moments, when the ticking would again return with its original intensity, unless the inflations were persisted in. After each inflation the reaction became weaker and the pauses greater, so that after several energetic efforts the silence became assured for several minutes or hours. Allowing the catheter to remain in the mouth of tube, without resorting to inflation, had no influence over sounds. During a prolonged course of treatment the ears progressively but slowly improved, under this form of inflation, until the clicking entirely subsided.

The muscular clicking having ceased after being under my care for a period of about six months, the patient passed from under my observation.

The subsequent history of patient under the care of Dr. H. A. Robbins, was that of a slowly progressing case of pachymeningitis.

The patient died February 21, 1891. The autopsy was made by Dr. I. W. Blackburn, pathologist to the United States Government Insane Asylum, in the presence of Drs. R. T. Edes and H. A. Robbins. Dr. Edes took notes. Unfortunately, I was not aware of the boy's death until some weeks after the occurrence

Autopsy.—Belton Adair, æt. 18, ten hours after death. Sutures visible externally as well as internally. Skull separated at apex of lambdoidal suture. Skull cap rather thicker than normal; although possibly softer than normal. Dura not unusually adherent. Slight delicate, filmy membrane adherent to dura along vertex on right side. Nearly the whole of the vertex of the inner surface, on left side, was covered by a thick, bulky false membrane, thicker in the center, thinning out toward the periphery, occasioned by a hæmorrhagic effusion. This membrane could be separated with considerable ease from the dura. Extreme œdema and opacity of pia. Convolutions shrunken over anterior and superior regions. Pia firmly adherent to cortex, separation only being attended with tearing away of cortical substance—this throughout. Difficult to say whether fluid was in subdural space or in subarachnoid—probably latter. Convolutions hard, with shrinkage more marked over superior portions. Ventricles contained a little more fluid than normal. Lining of fourth ventricle granular. Cribriform appearance very marked above anterior perforated space.

The most important point in connection with a case of clonic muscular ticking heard within the ear is to locate the particular muscle or group of muscles which is occasioning the peculiar sound heard. Few cases of this character fall under the observation of any individual observer, and therefore it is impossible almost to lay down differential points. We can only, reasoning from physiological functions, surmise what would take place in case of involvement of one muscle and what would occur were another affected. In this case the possibility of the involvement of other muscles than the muscles of the middle ear can be excluded, and for the following reason, viz.: the sound produced was clear and sharp, entirely different from that heard during the involuntary contraction of the constrictor or palati muscles. In case of palati and constrictor contractions there is visible movement in soft palate and pharynx. There was none noticed here. In contraction of pharyngeal muscles the patient is as much annoyed by the muscular twitching in the throat as by the noise in ears. The patient never once referred to any sensation in pharynx of this character. Deglutition would necessarily influence sounds were the pharyngeal group of muscles at fault.

Examination of patient some three months after cessation of spasm of muscles revealed the membranes less rigidly contracted, and the manubrium responding slightly to the use of Siegle's otoscope. The action of inflation would seem also to establish the implication of this muscle. The cessation of the clicking after many forced inflations, evidently due to the over-stretching of the tensor tendon, which would become for the time being unresponsive to centric irritation. The absence of visible movement in membrane proves nothing, as the vibrations produced by contractions of this muscle would be so slight as to be hardly recognized by the unaided eye. Monometric study would have been of value here, and its want of use was an act of negligence on my part. I had thought of dividing the tendon of these muscles, and tried to gain the consent of guardian, but it was of no avail. Had either of these observations been carried out the history of the case would have been complete.

The pathology of the spastic contraction in the present case seems to be one of centric origin, the lesion being probably at the seat of origin of the nerve supplying the tensor, or lesions involving the nerve in its passage through the cranial cavity. Individual nerves supplying individual muscles, nerves supplying groups of muscles, nerves of general sensation and nerves of special sense, were involved at progressive stages in the life history of this case, until the individual, shortly before death, became a motionless, sensationless and senseless mass of humanity. The cause of the contraction in the tensor, as in several other groups of muscles, must have been due to primary centric irritation. The cessation of ticking was more due to the destruction of the function of the nerve than to the treatment instituted by me.

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Discussion.

Dr. Randall said that he was able to cause voluntarily such a clicking sound in the ears, synchronous with palatal contractions, yet not wholly caused by them, since at times unilateral and independent. The sound is audible to outsiders, and seems to consist of a fine dry click as well as the moist separation of the Eustachian walls.

Dr. Lewis H. Taylor, Wilkes Barre, Pa.: I have notes of a similar case which I have always intended publishing, but as yet have never done so. The patient was a young woman of 25, in fairly good health, who came to me about three years ago on account of excessively annoying sounds in her ear, which were subjective and objective as well.

By placing my ear near hers, say 2 inches away, the sounds were distinctly audible, while with the tube in her ear and mine they were quite loud. They were of the nature of a constant ticking, regular and unvarying. She came for treatment, which I am sorry to say did no good, and I soon lost sight of the patient.

PURULENT BRAIN DEPOSITS, AND PHLEBITIS AND THROMBOSIS OF THE CEREBRAL VEINS AND SINUSES FOLLOWING EAR DISEASE.

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(*Continued from page 472.*)

Case 6.—Treated by Frank Allport, of Minneapolis, Minn. C. B., Male, age thirty-five. Entered City Hospital December 7, 1888. I saw the case December 10, at the request of Prof. Dunn.

At the date of his admission he was obviously very sick and his mental condition was such as to render a thorough knowledge of his previous condition impossible. We learned, however, that his left ear had discharged for about three months, accompanied by severe head pains. He has had a diarrhœa and chills; his tongue was dry and coated; he was delirious, and had aphasia and incoherent speech; no paralysis; the auditory canal was full of pus; there were no mastoid symptoms; there was a swelling just under the mastoid process in the neck, about the size of a hen's egg, that was somewhat tender, but not fluctuating; the surface of his body was very hot and dry; his temperature varied from 102½ to 103½, and his pulse was from 104 to 120. He died December 11.

Autopsy by Professors Dunn, Jones and myself. The large vessels of the dura and pia-mater were filled with dark blood; the inferior surface of the cerebellum is softened, discolored and purulent; the basilar artery and circle of Willis are filled with dark venous blood; the middle and internal ear contained foul thick pus; there is a purulent thrombus in the left petrosal sinus, both superior and inferior; there is a purulent thrombus in the lateral sinus and in the internal jugular vein; the external jugular vein for some distance down the neck shows evidences of purulent phlebitis; the vein from the auditory canal is in the same condition; pus is found in the semicircular canals; there is a thrombus in the basilar vein; the superficial posterior auricular glands were found to be much enlarged; there was no pus in the mastoid cells.

Case 7.—*Archives of Otology*, 1885. Treated by A. Hedinger, of Stuttgart. Female, age sixty-three. Right ear. Came to Hedinger in 1874, with a history of chronic otorrhœa. Fibrous tumor in meatus; numbness right side of neck and face; patient disappeared for years; came again in 1883; severe pain in ear; aural hæmorrhages intermixed with pus; totally deaf in right ear; fibrous tumor still present; pain in back of head and temporal region; swelling of temporal region; moderate fever.

April 23. Temporal swelling incised and pus liberated; improvement. May 17. Incision in the cheek is made and pus liberated. June 19. Another incision over mastoid muscle and pus liberated. Oct. 30. Painful swelling over posterior part of mastoid process. Mastoid opened and pus liberated. Nov. 8. Delirium; right pupil contracted. Nov. 12. Stupor. Nov. 15. Total unconsciousness; spasms of left upper and lower extremities; left facial paresis. Nov. 17. Death.

Autopsy.—Multiple pus sinuses in the neck; carious spots on outside of mastoid and occipital bones; congestion of dura-mater and pia-mater; the right sigmoid sinus, bulbous portion of jugular vein, and the mastoid emissory vein, all obliterated; tumor in middle ear; malleus and incus gone; pus in mastoid antrum; a carious canal leads from the mastoid antrum into a cavity in the sigmoid fossa; carious opening through the incisura santorini; caries of the pyramid; caries of the bony wall of transverse sinus.

Case 8.—*Archives of Otology*, 1885. Treated by A. Hedinger, of Stuttgart. Female, age fifty. Chronic otorrhœa, both ears. Vertigo, violent pain in the head, especially in occipital region. Temperature and pulse subnormal. Right ear contains polypus: removed. Left ear, chronic otorrhœa, simple. Received conservative treatment from Hedinger. Treatment unavailing; coma; death.

Autopsy.—Intense hyperæmia of all meningeal veins. In the center of the superior petrosal sinus is a small carious opening directly over the vestibule. Petrous bone carious. Pus in middle cranial fossa running into the canal of the medulla oblongata. Abscess in left posterior cranial fossa where cerebellum rests. Cholesteatoma in left mastoid antrum. Caries of semi-circular canal, vestibule and cochlea.

Case 9.—*Archives of Otology*, June, 1886. Treated by A. Truckenbrod. Male, age twenty-eight. Left ear, chronic otorrhœa. Has suffered from attacks of vertigo; has now chills; very painful spot on top of head; meatus narrowed; headaches; temperature rises moderately. Mastoid opened; found pus; improvement for a few days. Temperature rises again; pain in top of head and temple; paresis of right side of face; difficult speech; defective memory; aphasia. Diagnosis. Brain abscess.

Operation.—Fistula found in squamous bone directly above the meatus, which was enlarged. Search made for pus, which was found. Irrigation with sublimate solution 1–1,000. Sublimate gauze dressing; drainage tube; recovery.

The abscess was in the second left temporal convolution. The diagnosis was based on, 1. Oedema of this region; 2. Pain in this region; 3. Paralysis of right facial nerve.

Case 10.—*Lancet*, 1885, Vol. 2, page 665. Left ear. Treated by Hide Hilles. Chronic otorrhœa. Death.

Autopsy.—Cerebral meningitis. Abscess of left temporal lobe.

Case 11.—*Lancet*, May 15, 1880. Treated by James Allen. Female, age nineteen; right ear; chronic otorrhœa; deafness. Dec. 18, 1879. Ear-ache; entire head painful; vomiting; paraplegic; motor paralysis of lower limbs; scalp and spine very painful to touch. Death.

Autopsy.—Abscess beneath dura-mater on anterior surface of right petrous bone. Drum-head and ossicles destroyed. Pus in middle ear, mastoid cells, and labyrinth. Vertebræ in portions of cervical and dorsal spine carious. Pia-mater congested.

Case 12.—*Gazette des Hopit.*, No. 67, 1880. Treated by C. Miot, Paris. Male, age thirty-five. Tubercular. Chronic otorrhœa. Right facial paralysis. Painful mastoid. Death.

Autopsy.—Pus in middle ear and mastoid cells; ossicles gone; caries of tympanic walls; dura-mater red, thickened and softened. Facial nerve and chorda-tympani largely destroyed.

Case 13.—*Journal of Anatomy and Physiology*, Vol.

XIV. Treated by P. McBride and Alex. Bruce. Right ear. Chronic otorrhœa. Death.

Autopsy.—Pus in middle ear, mastoid cells, vestibule and cochlea. Abscess in outer half of right cerebral hemisphere, adherent to the posterior surface of the petrous bone, in the vicinity of the internal auditory nerve. Dura-mater detached at this point.

Case 14.—*Archives of Otology*, July, 1879. Treated by C. J. Kipp. Male, age twenty-three. Right ear; chronic otorrhœa. Acute exacerbation. Pain over right side of head. No mastoid tenderness. Meatus red; chills; fever; vomiting; headache; both optic nerves congested; convulsions; unconsciousness; bowels regular; coma; death.

Autopsy.—Longitudinal sinus filled with blood. Abscess in temporal lobe; not encapsulated; on removing the lateral sinus, puriform fluid escaped, which was found to come out of a round opening in the anterior and outer wall of the sinus. A large thrombus existed in the sinus. Pus in middle ear and mastoid cells. Drum-head perforated. Malleus and incus carious.

Case 15.—American Otological Society, July 25, 1882. Treated by A. Mathewson, of Brooklyn. Male, eleven years; chronic otorrhœa; mastoiditis; apparently cured; recurrence; convulsions. Death.

Autopsy.—Abscess of cerebellum. Pus between dura-mater and tegmen-tympani.

Case 16.—American Otological Society, July 25, 1882. Treated by C. S. Merrill, of Albany. Male, age 32; acute otitis. Death.

Autopsy.—Pus over the region of the petrous bone, extending from the tympanic cavity through two or three small openings in the tegmen-tympani.

Case 17.—*American Journal of Medical Sciences*, May, 1892. Treated by G. W. Prentiss. Male, age 31. Right ear; chronic otorrhœa: earache and headache; chills; fever; high temperature; pain in the temporal region and over right eye; mastoid unaffected. Death.

Autopsy.—Abscess in anterior lobe of left hemisphere of cerebellum. Marked discoloration of the dura-mater covering the petrous portion of the temporal bone. Caries of petrous bone at this point. Lateral sinus filled with clotted blood. Purulent opening through the walls of lateral sinus communicated with the abscess.

Case 18.—*American Journal of Otology*, July, 1882. Treated by Mr. Field, of England. Male, age 42. Chronic otorrhœa; left ear. Death.

Autopsy.—Congestion of dura-mater. Puro-lymph in meshes of pia-mater over the left sphenoidal lobe. Abscess in left lobe of the cerebellum. The temporal bone was considerably necrosed with yellowish and greenish discolorations on the walls of the tympanum. Middle ear full of pus. Drum-head gone.

Case 19.—*Philadelphia Medical Times*, August 27, 1891. Treated by G. C. Harlan. Female, age 14. Left ear; chronic otorrhœa; left facial paralysis. Death.

Autopsy.—Meningitis. Abscess of the left lobe of the cerebellum. Almost entire destruction of the anterior wall of the ex. meatus. Drum-head gone. Caries of middle ear.

Case 20.—*Edinburg Medical Journal*, June 1881. Treated by Robert Sinclair. Male, age 22; right ear; Chronic otorrhœa; took cold; unconscious; maniacal; right pupil contracted; mastoid swelling. Wildes' incision. No relief. Death.

Autopsy.—Abscess having a direct communication with the middle ear, in tempero-sphenoidal lobe.

Case 21.—*Australian Medical Journal*, April 15, 1881. Treated by Robertson. Male, age 39; left ear. total deafness; no previous history; purulent discharge from ear; left facial paralysis. Death.

Autopsy.—Caries in middle ear. Abscess in left middle crus-cerebelli, extending partly into the cerebellum itself, and inwards into the pons abutting on the fourth ventricle and pressing on the seventh nerve.

Case 22.—*New York Medical and Surgical Brief*, February, 1879. Treated by W. Oliver Moore. Male, age 50. Right ear; chronic otorrhœa; acute exacerbation; swollen mastoid; abscess opened; vomiting; semi-consciousness and facial paralysis; divergent strabismus. Pupils contracted. Death.

Autopsy.—Caries extending backward and upward from the mastoid portion as far as the parieto-occipital suture. There was an opening through this suture leading into cavity of the skull on a level with the lateral sinus. The sinus was empty and felt like a fibrous cord. A probe passed through it was arrested just where the lateral sinus joins the jugular vein. Meninges very much congested. Pus in the posterior fossa between dura-mater and skull. Caries at this point. Abscess in right lobe of cerebellum.

Case 23.—*Glasgow Medical and Surgical Journal*, January, 1880. Treated by Thomas Barr. Male, age 17; left ear; chronic otorrhœa; pain, especially in left side of forehead; lanquid and drowsy; vomiting; aphasia; epilepsy.

Autopsy.—The left sphenoidal lobe was found adherent to the bone beneath. Abscess in left sphenoidal lobe. Petrous bone carious in two places. One through roof of the tympanum; the other in the groove for the lateral sinus. The last one communicated with the mastoid cells.

Case 24.—*Journal of Anatomy and Physiology*, April, 1888. Treated by P. McBride and Alexander Bruce. Female; chronic otorrhœa; death.

Autopsy.—Abscess in cerebellum, right lobe.

Case 25.—*Gazette Hopitaux*, No. 39, 1885. Treated by Jaccoud. Right ear; tubercular case; sudden pain and deafness; profuse discharge; vomiting and dizziness; mastoid painful; fever; death.

Autopsy.—Pus at base of middle lobe of cerebrum. Tympanic cavity purulent, granular and carious. Drum-head destroyed.

Case 26.—*Von Langenbeck's Archives*, Vol. 28, page 556. Treated by T. H. Gluck. Right ear; chronic otorrhœa; aural hæmorrhages; headache; fainting; convulsions; amaurosis; soporous condition; facial paralysis; paralysis of right arm.

Operation.—Posterior wall of meatus chiselled away, also a portion of the mastoid. The dura-mater was exposed, and appeared fluctuating. Pus found between dura and pia-maters. Death.

Autopsy.—Purulent degeneration of the dura mater, especially from the longitudinal sinus to the base of the brain.

(*To be continued*)

THIOCAMF presents a ready way of using sulphur dioxide as a disinfectant. He says a combination of camphor and sulphurous acid presents the germ-destroying agent in a very concentrated and convenient form.

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SATURDAY, OCTOBER 22, 1892.

AMŒBIC DYSENTERY.

The clinical term dysentery includes various forms of intestinal flux due to inflammation and usually ulceration of the large intestine. While the primary etiological agents in the acute catarrhal and the diphtheritic forms of dysentery are as yet but imperfectly understood. The so-called tropical variety of dysentery has been made the subject of investigations that show it to be a distinct disease from an etiological, a clinical, as well as an anatomical standpoint. The investigations of LOSCH in Russia, of KARTULIS in Egypt, of COUNCILMAN and LAFLEUR as well as others in this country and elsewhere, show the amœba coli (LOSCH) of dysenteræ (COUNCILMAN and LAFLEUR) to be constantly present in the evacuations and in the intestinal lesions of tropical dysentery as well as in the quite frequent secondary liver abscesses and in the sputum after the rupture of such purulent collections into the lung. KARTULIS and HLAVA have made successful injections into the large intestine of cats and dogs with pure amœbic cultures on straw infusion or with dysenteric stools. The amœba is a unicellar, neucleated, proto-plasmic and vacuolated organism, capable of amœboid movements, showing usually a clear outer zone or ectosare and a granular and vacuolated inner zone or endosare; it varies in diameter from 10-30 or more micro-millimeters, and is very easily demonstrated in the warm stools of tropical or amœbic dysentery the diagnosis of which practically rests upon the detection of the amœba in the discharges. The excellent clinical and anatomical studies of COUNCILMAN and LAFLEUR (*Johns Hopkins Hospital Reports*, vol. ii, 1891), based upon a thorough review of the literature and the analysis of 15 cases of the disease occurring mostly in OSLER'S wards, showed that amœbic dysentery has a variable onset, course and duration with intermissions and exacerbations, tending always to chronicity and early anæmia; that abscess of the liver with or without lung involvement is a frequent complication; that anatomically the ulcers differ from those of other forms of dysentery, being produced by a primary submucous infiltration and subsequent necrosis of the mucous membrane, and consequently they present very distinctly undermined edges; in these ulcers as well as in the liver abscesses purulent inflammation is absent unless a secondary infection with bacteria should occur. As is well known, tropical dysentery is very common in tropical and subtropical countries where it frequently occurs in epidemics, but it also appears throughout Europe and North America. MUSSER has demonstrated the disease in Philadelphia and HEKTOEN not long ago exhibited before the Chicago Medical Society specimens of the intestine with microscopical preparations, from a typical case occurring in a young man who died in Chicago, after having contracted the disease in Galveston, Texas. Comparison of the specimens of dysenteric intestine in the Army Medical Museum at Washington, gathered during the War of the Rebellion by the industrious and able WOODWARD, with the intestine of the amœbic dysentery of to-day show the lesions to be in many instances exactly alike. The natural habitat of the amœba dysenteræ has not yet been found, but it is thought that drinking water is one of the sources of infection.

SUTURE OF THE SPINAL CORD.

In an able paper read before the American Surgical Association in 1891, PROFESSOR J. WILLIAM WHITE reviewed the subject of the surgery of the spine, and made a very complete survey of the reported cases of operative measures employed to relieve the consequences of spinal traumatism. Of the thirty-six cases of laminectomy performed in the post-antiseptic period, fourteen, or thirty-nine per cent., died; but he concluded that the results in general were encouraging for the advantage of surgical interference, except in those cases in which there was disorganization of the cord.

Of course, in all cases of spinal traumatism, more or less injury to the cord ensues; and the influence of operative interference on the degenerative process in those cases in which there is no injury to the vertebræ, is a matter of great surgical importance, including as it does, the questions of early or late operations, and of a more important factor, the desirability of operating on the cord itself.

In 1852 PROFESSOR BROWN-SEQUARD published the results of his experiments, showing that a more or less complete regeneration of the continuity of the various tracts in the spinal cord followed hemisection of the cord at various levels. The cords removed from the animals experimented upon, were examined by FOLLIN, LEBERT, LABOULBENE and

ROBIN, who found reunion of the severed portions with a new production of cells and fibres. In the past year similar experiments were performed by FR. SGOBBO, who was unable to obtain regeneration of the cord in any subject of his experiments except the triton; he used also, lizards, tadpoles, frogs, pigeons and dogs. Histological examination showed, however, in all of the animals examined, that notwithstanding the degenerative processes in the gray and white substances of the cord the epithelial cells of the central canal remained intact or were in a fair condition for regeneration. The embryonic origin of the cord being from this epithelium, and the new cord in the triton arising from it also, we must look for some intrinsic cause for the failure of the nervous elements to proliferate and unite. Pathologically this cause seems to be the rapid formation of connective tissue and its interposition between the severed ends.

Such a result often follows traumatic section of a nerve; and exsection of the fibrous band with coaptation of the freshened ends has resulted in restoration of the integrity of the nerve.

This has probably induced surgeons to ask themselves if the same result could not be accomplished in cases of old injury to the spinal cord. DR. R. T. MORRIS published in 1886 the history of a case of traumatic paraplegia, on which he operated in 1885 with the intention of excising the damaged portion of the cord and suturing the ends together. On exposing the cord he found the injured tract so extensive that exsection was out of the question.

CHIPAULT has recently brought this matter forward again, in an interesting paper on the surgery of the spinal cord in the *Revue de Chirurgie* for August. He considers such an operation to be impossible anatomically. He states that in the cadavers of three persons who had vertebral fracture, in two of which there was complete section of the cord, the retraction of the medullary segments and the extent of the sclerosis necessitated a resection of several centimeters; and the loss of elasticity of the cord as well as the resistance of the ligaments formed by the pia mater, prevented the apposition of the resected ends. If the cord has been simply divided by a cutting instrument it may be sutured in the cadaver, and without doubt in the living subject, by fine silk sutures passed through the pia mater.

It is possible that some of the questions involved in suturing the spinal cord may be determined by experiments upon animals. But MORRIS's experience in finding an extensively degenerated tract that precludes exsection, would probably be paralleled by most surgeons operating on old spinal injuries with a similar end in view. For various experimenters, in testing the elongation of the cord by suspension of the cadaver, found that the lengthening varied from eight to twelve millimeters (five to eight-sixteenths of an inch), while several centimeters may be diseased. So it would be manifestly impossible to co-aptate the ends after excision of so long a portion of the cord; nor would this probably be facilitated by the proposed excision of a vertebra. It is evidently better to operate early in such cases of spinal injury as indicate osseous or sanguineous pressure on the cord, thus lessening the risks of fibrous degeneration and consequently eliminating the question of excision and suture.

THE ENCOURAGEMENT OF HIGHER MEDICAL EDUCATION BY PHYSICIANS.

There is a sentiment among many physicians that a thorough preliminary education, equal to the bachelors' degree in science or arts, is unnecessary and even undesirable for the young medical student. Students are frequently advised by their preceptors to discontinue their literary and scientific education to begin the study of medicine in the office of the doctor. To such advice medical educators sometimes add the weight of their too eager opinion. But the unbiased and thoughtful educator will always encourage thorough literary training. The country is so much more prosperous that the number of college graduates has increased two hundred per cent. or more since the war, and there is reason to believe that our medical school can soon have a class, the majority of whose members have received liberal educations. Let no preceptor advise the young aspirant for a medical career to discontinue his college course short of its completion.

In another manner the preceptor is often a great sinner against the best interests of the student and the profession. He gives a certificate of study where there has been no study. Every preceptor's certificate should show the number of hours spent in recitations and quizzes, the subjects studied and the facilities for study. The writer deprecates the ruling of the Illinois State Board of Health allowing one year's study under a preceptor to count as one year of time on a four year course. If such study is of any value, its value is derived from the association with a high minded physician, from experience in the management of patients and patients' families, and from clinical study of suitable cases. All of these advantages are better secured during the long vacations or by study with a preceptor after the medical studies in the college are nearly finished. Now the preceptor's certificate is generally a fraud. It should never be given and should never be received. It needs no other evidence of its fraudulent character than the fact that students frequently possess themselves of two such certificates from two honorable physicians, covering the same time, and in one instance a student fortified himself with four, though

he had all the time been engaged in an incompatible vocation.

The best service the practitioner and preceptor can do medical education to-day, is to encourage the highest standard of preliminary education, insist on the four years of attendance at the medical school, supplement the training of the medical school with adequate opportunity for obstetrical practice and practice in medicine, and surgical diagnosis, and instruction in medical ethics both by precept and example.

SKIN-GRAFTING FROM THE DOG.

At Bellevue Hospital, New York, the integument of a black and tan dog was used to repair an extensive injury to the scalp. The patient, a woman, sustained an accident in December, 1890, which has rendered necessary six grafting treatments. In the preceding operations, human grafts had been employed, the skin having been taken from the legs and arms of her husband and her friends. These have been only partially effective, an unhealed surface at the top and back of head nearly six by nine inches having resisted the former implantations. The most recent attempt was the use of a canine graft, a procedure that has seldom been used in this country, although it has in certain sections of Europe been quite frequently tried. In this Bellevue case, both the woman and the dog were anæsthetized, and the dog was killed after the removal of the graft.

AN ALLIANCE OF QUACKS

The bone-setters of France have formed a defensive alliance with the magnetic healers, mediums, *masseurs* and others of that class, their object being to organize a national league "to protect and advance their professional interests." In a recent manifesto complaint is made that there is a tendency towards an "undue and unauthorized legislative interference" and a claim is made that it is the inalienable right of all men to heal themselves, or get treatment wherever and from whomsoever they may elect. They therefore propose to make themselves felt in the elections; the specious cry of "fair play" will be put into active use early and late, and it will not be surprising to learn that they secure a semblance of legality.

HAVING been asked to undertake a research at the expense of the Government of his Highness, the Nyzam of Hyderabad, India, with the object, if possible, of reconciling the conflicting views concerning the action of chloroform, I am anxious to receive from American physicians and surgeons records of any cases where it was noticed that the heart stopped beating *before* respiration, or respiration stopped *before* the heart. Notes concerning any such cases will be considered strictly confidential, provided the reporter states his desire that his name shall not be mentioned in the report of the research when it is finished. Otherwise due credit will be given for any information received.

H. A. HARE,
Jefferson Medical College, Philadelphia.

CHAMBER OF COMMERCE CHOLERA REPORT, NEW YORK.—We have received a copy of the report on cholera made by the Advisory Medical Council of the above named body. The report is signed by Drs. Stephen Smith, Chairman, Abram Jacobi, E. G. Janeway, T. M. Prudden, R. H. Derby, Hermann Biggs and Allen M. Hamilton. These gentlemen were selected to fill the honorary positions on this Council, by a special committee of the Chamber of Commerce, early in September, and their report was handed in on the 21st of that month.

The report is worthy of reproduction here in its entirety, but we propose now to quote only a paragraph relative to a short detention of persons at quarantine stations. The Council reports as follows: "We believe that under ordinary conditions the period of quarantine detention of healthy persons when removed, as they should be at once on their arrival in port, from all known or possible sources of infection, and properly placed, should be five days in case no cholera occurs among them." This paragraph, with others of a like tenor in the report, indicates that a more enlightened and humane spirit will in the future direct the form and duration of that imprisonment of innocent persons that is called "quarantine." Detention cannot be, and will not be, abandoned, but it will be planned and maintained with less of panic and heartlessness than has been the case in the past.

It is interesting to note that among the members forming this honorary Council there are several who only a short time before made their exit from the New York City Board of Health, because of the peculiar methods of the latter towards its medical officers. Not to name them all again we would say that we refer to Drs. Stephen Smith, Jacobi and Janeway. They were allowed to quit the Board with some sneering remarks about "having feathered their nests" and other similar reflections (see the letter published in this JOURNAL, August 6). Only a few weeks roll away, and with cholera at our doors, we see the great Chamber at once calling to its aid these selfsame leaders and authorities in preventive medicine. And we see these representative medical men responding promptly and effectively, and thereby illustrating the time-honored adage, "*Miseris succurere didici.*"

It may be expedient in a later issue to publish the entire report.

BOOK REVIEWS.

ATLAS OF CLINICAL MEDICINE. By BYRON BRAMWELL, M.D., Assistant Physician to the Edinburgh Royal Infirmary, etc. Vol. ii. Part 1. Edinburgh: T. and A. Constable, University Press.

The first part of the second volume of this valuable work has just been issued. It maintains the high standard so characteristic of the excellent professional work that Dr. Bramwell is accustomed to do, and which is so familiar to the medical profession.

The subjects treated of in this number are: 1. Scrofula; 2. Unilateral hypertrophy of the skull; 3. Measles; 4. Two cases of Friedreich's ataxia, in which the knee-jerks are not

lost. 5. Alterations in the fields of vision, their clinical significance and importance. Illustrative cases: Permanent hemianopsia due to a destructive lesion of the half-vision centre. Temporary hemianopsia due to an irritative lesion of the half-vision centre.

The plates are: Two ofscrofula; two of unilateral hypertrophy of the skull. Measles. Perimeter charts showing alterations in the fields, both for white and for colors, in cases of hemianopsia. Naked eye appearance of the brain in two cases of lesion of the half-vision centre. A series of transverse vertical sections through the brain in a case of lesion of the half-vision centre.

With this part are also issued: Perimeter charts, showing the fields, both for white and for colors, in cases of central amblyopia (? tobacco amblyopia) and lead poisoning. Secondary syphilis.

All of the illustrations are more than ordinarily well executed. It is to be desired that the work be so well supported as to ensure continuance of its publication, whilst it maintains its present high standard.

MISCELLANY.

TRI-STATE MEDICAL SOCIETY OF GEORGIA, ALABAMA AND TENNESSEE will meet in Chattanooga, Tenn., Tuesday, Wednesday and Thursday, October 25, 26 and 27. The following papers will be presented:

1. Eye Symptoms in General Disease, J. L. Minor, Memphis, Tenn.
2. Talipes Equino-varus (with presentation of patients), C. W. Barrier, Rome, Ga.
3. Sequences of Otitis Media Purulenta, T. Hilliard Wood, Nashville, Tenn.
4. Report of 1,050 Strabismus (Cross Eye) Operations, with some Observations on the Same, A. W. Calhoun, Atlanta, Ga.
5. Hypertrophic Rhinitis. Gilbert I. Cullen, Cincinnati, O.
6. Croupous Rhinitis, with Report of Cases, J. W. Long, Randleman, N. C.
7. Special [illegible]s. General Practice in Medicine, W. J. Killen, Birmingham, Ala.
8. The Present Status of Medical Education in the South, Luther B. Grandy, Atlanta, Ga.
9. Synovitis, J. B. Cowan, Tullahoma, Tenn.
10. A Clinical Study of the Relations between Scarlet Fever and Diphtheria, W. D. Hoyt, Rome, Ga.
11. Pharmaceutical Preparations of the Present Day, John C. LeGrand, Anniston, Ala.
12. Comparative Value of Proprietary and Pharmaceutical Preparations, Harry Wise, Ph.G., Chattanooga, Tenn.
13. The Treatment of Inguinal Hernia, J. W. Handly, Nashville, Tenn.
14. Surgery—Things to Do and Things not to Do, Willis F. Westmoreland, Atlanta. Ga.
15. Treatment of Indolent Buboes. W. B. Rogers, Memphis, Tenn.
16. The Prepuce: Its Uses and Its Dangers, Erasmus T. Camp, Gadsden, Ala.
17. Stricture of the Male Urethra: Its Diagnosis and Treatment, W. L. Gahagan, Chattanooga, Tenn.
18. A case of Injury to Some of the Cervical Vertebræ Combined with Transverse Fracture of the Occipital Bone, R. H. Hays, Union Springs, Ala.
19. Report of a Case of Rupture of the Abdominal Muscles During Normal Labor, J. W. Hallum, Carrollton, Ga.
20. Report of a Case of Intestinal Obstruction, J. F. Huey, Birmingham, Ala.
21. A Few Selected Cases in Laparotomy, W. H. Wathen, Louisville, Ky.
22. The After-treatment of Abdominal Operations, W. E. B. Davis, Birmingham, Ala.
23. Hepatic Abscess, E. B. Ward, Selma, Ala.
24. Report of Treatment of Sterility, J. M. Head, Zebulon, Ga.
25. Extra-uterine Pregnancy, Richard Douglass, Nashville, Tenn.
26. A Case of Imperforate Hymen, Andrew Boyd, Scottsboro, Ala.
27. Puerperal Eclampsia, with Report of Cases Treated with Nitro-Glycerine, R. M. Harbin, Calhoun, Ga.
28. Erythema, Henry Wm. Blanc, Sewanee, Tenn.
29. Epithelioma; Some Experience, M. B. Hutchins, Atlanta, Ga.
30. Drunkenness and Its Gold Cure (?), John P. Stewart, Attalla, Ala.
31. Summer Diarrhœa of Children, G. T. Prince, Whiteside, Tenn.
32. Advanced Theories in Psychical Science, John E. Purdon, Cullman, Ala,
33. Dysentery and the Most Successful Ways of Treating It, D. H. Baker, Gadsden, Ala.
34. Diagnosis of Fevers, J. A. Long, Cleveland, Tenn.
35. Cholera and the New York Episode, Joseph Holt, New Orleans, La.

MEETING OF INTERNATIONAL MEDICAL CONGRESS (American Public Health Association), in the City of Mexico, November 29th and 30th and December 1st and 2nd, 1892. For the convenience of delegates, and all physicians with their families, who desire to attend this meeting, an elegant Pullman car will leave Chicago November 19th. Short stops will be made at all points of interest between Chicago and the City of Mexico. For further information, maps, time tables, etc., address John E. Ennis, D. P. A., Mo. Pac. Ry., 199 Clark street, Chicago, Ill.

OFFICIAL LIST OF CHANGES in the Stations and Duties of Officers Serving in the Medical Department, U. S. Army, from October 8, 1892, to October 14, 1892.

Capt. Henry P. Birmingham, Asst. Surgeon U. S. A., is granted leave of absence for one month.

Major Daniel G. Caldwell, Surgeon U. S. A., is granted leave of absence for fifteen days.

By direction of the Acting Secretary of War, Par. 3, S. O. 199, A. G. O., August 24, 1892, is revoked, and Capt. Louis M. Maus, Asst. Surgeon U. S. A., is relieved from duty at Ft. Apache, A. T., and will report in person without delay to the commanding officer, Whipple Bks., Ariz., for duty at that station.

First Lieut. Isaac P. Ware, Asst. Surgeon U. S. A., is relieved from duty at Ft. Logan, Col., and will proceed without delay to Ft. Supply, Ind. Ter., and report in person to the commanding officer of that post for duty.

Major Robert H. White, Surgeon U. S. A., is relieved from duty at Ft. Myer, Va., to take effect on the expiration of the leave of absence granted him, and will then proceed to report in person to the commanding officer, Jefferson Bks., Mo., for duty.

Major Daniel G. Caldwell, Surgeon U. S. A., is relieved from duty at Jefferson Bks., Mo., and will report in person to the commanding officer, Madison Bks., N. Y., for duty at that post.

Capt. William C. Gorgas, Asst. Surgeon U. S. A., is relieved from duty at Ft. Barrancas, Fla., and will report in person to the commanding officer, Ft. Reno, Oklohoma Ter., for duty at that post, relieving Capt. John L. Phillips, Asst. Surgeon. Capt. Phillips, on being relieved by Capt. Gorgas, will report in person to the commanding officer, Ft. Myer, Va., for duty at that post.

Capt. Henry L. Turrill, Asst. Surgeon U. S. A., is relieved from duty at Madison Bks., N. Y., to take effect on the expiration of his present leave of absence, and will report in person to the commanding officer, Ft. Riley, Kan., for duty at that post, relieving Major John Van R. Hoff, Surgeon U. S. A. Major Hoff, on being relieved by Capt. Turrill, will report in person to the commanding officer, Ft. Columbus, N. Y., relieving Major Johnson V. D. Middleton, Surgeon U. S. A. Major Middleton, on being relieved by Major Hoff, will report in person to the commanding officer of the Presidio of San Francisco, Cal., for duty at that post.

OFFICIAL LIST OF CHANGES in the Medical Corps of the U. S. Navy, for the Week Ending October 8, 1892.

Asst. Surgeon R. M. Kennedy, from the training ship "Richmond," and to the coast survey str. "Bache."

Medical Inspector T. C. Walton, ordered to the Naval Academy.

Medical Director B. H. Kidder, from the Naval Academy, and to the naval station at Port Royal, S. C.

P. A. Surgeon W. F. Arnold, from the naval station at Port Royal, and to the U. S. S. "Richmond."